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ORIGINAL ARTICLES.

HEREDITY AS A SOCIAL BURDEN.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, held at Atlanta, Ga., May 5-8, 1896.

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It may appear a waste of time to place before you proofs of the existence of heredity as a large factor in the production of those nervous diseases on which I wish to speak briefly to-day. My reason for doing so is two-fold. The existence of heredity as such a factor has been occasionally denied by men of such position that their opinion must carry weight, even though they are opposed by the majority of the thinking men who have given this matter their attention. The existence of heredity appears thoroughly established by statistics which have been most carefully compiled and verified. Moreover, the great number of these defectives, and the vast, ever-increasing expense of their maintenance, as well as their harmful influence on society at large, can only be realized in this way.

The three forms of disease which are most liable to make their victims dependent on society by rendering self-support impossible, or their society dangerous, are epilepsy, insanity and imbecility. In dealing with heredity in connection with these three forms of nervous disturbance, it is not reasonable to expect each condition to exactly reproduce its kind. The law of heredity is that each characteristic in the parents *tends* to reproduce itself in the offspring. Characteristics derived from one parent may be overcome by the influence of the other, and may even reappear a generation farther on, or be permanently obliterated. The three above named conditions are all simply evidence of degenerative changes of the nervous centers, dependent for their form on the portion of the brain attacked, and the age at which they develop. Brain trouble occurring early in life occasions imbecility; later, insanity; while epilepsy may complicate either condition or, rarely, occur independently. Almost any lesion or trophic change in the brain may occasion one or more of these manifestations of disturbed nervous action.

Let us look first at epilepsy as an inherited neurosis. The statistics being more accurate than in the other two diseases, for the reason that its symptoms are unmistakable, and thus friends can neither deceive themselves or others in regard to its existence. Even in uncomplicated epilepsy, if the spasms are at all frequent, the sufferer's power of self support is lessened, if not entirely destroyed, and he becomes a burden on friends or the general public. Echeverria, after ten years' careful research in tracing the offspring of epileptics, has published the most valuable statistics on this subject that I have yet found. Excluding all cases which could not be fully verified, he found that 62 male and 74 female epileptics begot 553 children whose life histories were as follows: 22 were still born; 195 died in infancy from spasms; 78 lived as epileptics; 18 lived as idiots; 39 lived as paralytics; 45 lived as hysterical; 6 had chorea; 11 were insane; 7 had strabismus; 27 died young from other causes than nervous disease; 105 were healthy. Excluding the last three divisions we have 414 out of 553 who either died in utero or were affected with nervous disease. Could a more convincing story be told? He concludes that the marriage of epileptic women to non-epileptic men is more liable to result in neurotic offspring than when the conditions are reversed. He quotes one case when two epileptics married and out of five offspring two died of infantile convulsions, one from hydrocephalus, one lived an epileptic, and one was said to be bright. Of his 136 original cases 87 had parents with either insanity or epilepsy, while in forty-six cases epilepsy had existed through three generations. One woman had epilepsy from puberty to her marriage, which demonstrates that marriage may benefit epileptics, but of four children born afterward, two were epileptic and one paralytic. Dr. Knight of Lakeville, Conn., in an address before the American Conferences of Charities and Correction, quotes a case where an epileptic mother bore fifteen children. Eight died in infancy, two were fairly teachable imbeciles, two were epileptics and three had sufficient intelligence to secure husbands and thus risk the multiplication of their kind. Dr. Landon C. Gray tells of an epileptic woman who bore nine children, seven of which died of infantile convulsions.

I studied the records of 500 epileptics at the Elwyn (Pennsylvania) school for the feeble minded during my residence there as a medical officer. Of these 149 were very incomplete. In the remaining 351 I found neurotic disease in 108 families on the father's side; in 106 on the mother's side; in 22 instances on both sides, or 236 families in all. In 19 other families some neurosis existed in brothers or sisters, but was not acknowledged farther back. From my personal knowledge of some of the families, I am sure that strict truth and the power to see "themselves as others see them" would swell these figures considerably. Insanity, imbecility and epilepsy with 56, 58 and 71 cases respectively, figure most prominently in this array of epileptic inheritance, chorea, paralysis, etc., forming the remainder.

The heredity of insanity is not so evident, nor is it so certainly transmitted to offspring, especially in neurosis of the same form, as is epilepsy. The reason for this may be looked for in the fact that many cases of insanity are the direct result of excesses, or other causes occurring in adult life. The transmitted effect manifests itself more frequently in childhood

or infancy, and epilepsy or imbecility results. Or possibly we may find that incurable perversion of the moral nature, aptly termed "moral imbecility," which furnishes so much contention as to whether it should be regarded and punished as depravity or treated as a congenital absence of the faculty of moral control. A smaller number reach mature years before coming into their inheritance of misfortune and are classed as insane, and occasionally reproduce the parent malady with singular exactness. Savage, the eminent English authority, states the matter very concisely as follows: "Heredity produces some insanity, but is more likely to produce either mental defect or special and unusual forms of muscular, sensory mental or moral disorder." Nearly every systematic observer admits heredity as an etiologic factor in insanity, and while the most conservative statistics place the average from 20 to 25 per cent. of the cases observed, others place it higher and Kestevan says: "The most influential of causative conditions is heredity, and it is the most commonly suppressed by the friends." The truth of the last statement at least is indisputable. I wish to particularly emphasize the influence of heredity in imbecility and idiocy for the following reasons. They are the legitimate offspring of nearly every form of neurotic taint. Their extent and baneful influences are not realized by any one who has not given the subject very careful study. The census reports for 1890 and the natural increase would bring their number to between 90,000 and 100,000. This is far below the real number. So slow are parents to publish their children to strangers as feeble minded, that the late Dr. Kerlin of Elwyn, Pa., investigated the matter. Out of 295 applications for admission to his school in 1880, 178, or 60 per cent., could not be found on the census enumerators list. How far this may apply throughout the country we can only surmise, but mothers are much the same everywhere, and are not willing to publish their childrens' defects.

There are two conditions in parents which figure largely in the production of feeble mindedness in children, tendency to neurotic disease and inebriety. These conditions are associated with the greatest frequency. Dr. Beach of England states that drunkenness is found in the ancestry of 38 to 40 per cent. of the parents of idiots (using the term idiot in its broadest sense). The Fourth Conference for the Care of Idiots in Germany agreed that inebriety was the principal cause of idiocy. In this country the Association of Medical Officers engaged in the care of the feeble minded agreed unanimously that a large per cent. of imbecility is due to the transmitted effects of alcohol and counseled, as did the German conference, more stringent legal restriction of its sale. It is well to bear in mind, in regard to these conclusions, that we can not draw too close a line between the habitual inebriate and the neurotic, for one class merges into the other and makes the distinction between cause and effect a difficult study. A cloud of witnesses testify to the transmission of neurotic taint in one or more of its many forms, to produce the multitude of imbecile and idiot children whose large aggregate number and marked increase is shown by every census. The largest and most complete studies on this subject have been made by Dr. Barr in this country and Drs. Beach and Shuttleworth in England. The work of these gentlemen is too well known to make any doubt of the great care exercised in the preparation of their tables, or the accuracy of their results, possible.

	Barr.	Beach.	Shuttleworth.
Total cases	1,044	1,080	1,200
	Per cent.	Per cent.	Per cent.
Insanity and imbecility	38.02	22.71	20.08
Other neuroses	21.55	36.85	Incomplete.
Total	59.57	59.56	

If we accept the aggregate totals of Barr and Beach which are nearly alike we have nearly 60 per cent. of the families with more than one victim of nervous disease. These figures fairly illustrate the results of other observers. We can not go much into detailed cases, but I would like to quote Dr. Ireland in illustrating the persistence of this tendency to produce offspring of low grade in some cases. He cites an instance where four illegitimate feeble minded children were born to one defective woman from four different fathers. In another instance, under my own care, was a little idiot boy with the well-formed but lax and useless muscles in certain regions, which usually accompany the cerebral condition known as microgyria. His mother, a robust, high grade imbecile with no apparent physical defect, came to see him. She had married again and bore in her arms another idiot child very similar to his half-brother. A local physician assured me that they were certainly the children of different men, the second husband not having come to that region until after the birth of the first child.

Such is the evidence that tendency to nervous degeneration or instability descends from generation to generation, broken or interrupted perhaps by infusion of stronger elements, reappearing a generation farther on. What is their number and to what extent do they affect the welfare and progress of the public? Of epileptics, Dr. Knight, who has given their care much study, estimated that in 1892 there were, in this country, 19,000. They almost invariably drift into imbecility, dementia or other form of insanity, and are cared for, if cared for at all, under these heads. Some children recover, but adults very rarely. They are ever liable to injury, which prevents their following many forms of employment. They are free to marry if they can find a mate, and there are very few who set out earnestly on that quest and are not very particular, who do not succeed; and they leave as a legacy to the public more epileptics. When subject to attacks of epileptic mania no class of the insane are more dangerously violent.

The number of the insane in the country will hardly number less than one hundred thousand. Probably there are more. It would be difficult to ascertain the total cost of their support. We will look at the approximate cost in the two largest States which in 1890 contained about one sixth of the population of the country, which will furnish some guidance to the possible expense in the whole country. In Pennsylvania, in 1894, there were 8,616 insane in institutions of all kinds, of which number 6,342 were in the six State hospitals and the private hospitals at West Philadelphia and Frankford. These 6,342 insane represented an expenditure of nearly one and one-half million dollars. The care of less than one-eighth of the State's feeble minded added $150,000 to this large total. New York spent in 1893 for the care of her insane in public hospitals and for a small proportion of her imbeciles, over two and a half millions of dollars. Carry out this ratio throughout the country and the amount would be startling. The bulk of the insane are in asylums, for public safety

demands this. Where are the feeble minded, who are found in European countries to outnumber the insane, and probably would here if properly enumerated? Not one-tenth are cared for in institutions. The remainder are in almshouses where their proper care is, in many cases, doubtful. Many are in homes where they monopolize their mothers' time and care, and elsewhere, where they are teased by children, abused by the vicious and live a strange life among their own people, with whom they have little in common. From the highest grades of imbeciles are recruited the ranks of petty criminals, prostitutes and tramps, who marry early and often, and who reproduce with the frequency of animals. Officers in reformitory institutions are becoming impressed with the idea that the majority of the younger criminals are permanently lacking in the higher mental traits, without which the development of moral character is difficult if not impossible. The growth of the burden on the industrious of supporting the helpless and the worthless may be better realized when we find that the New York State Board of Charities and Correction expended nearly eight and one-half millions of dollars in 1880 and nearly sixteen and one-half millions in 1890, although the population in that decade increased less than 20 per cent. Do you realize that the taxpayer may support, during a life of ordinary duration, members of three generations of these defectives? The remakable increase in numbers in a family line of defectives and incapables may be best illustrated by quoting two instances. One, founded on the report of Miss Schuyler, President of the New York Charity Aid Society, of "Margaret the Mother of Criminals," and progenitor of a family of paupers, beggars, prostitutes and criminals, which finally became a race of 700. Their family vigor was largely preserved by intermarriage with fresh, vigorous families of ruffians, and some of the women bore at least twenty children, among which were numbered insane, epileptic and imbecile. I would quote briefly from Dr. Barr's exhaustive article on the influence of heredity on idiocy, the record of the family known as the "Tribe of Ishmael," where the descendants of one unclean, neurotic man traced through many years, "multiplied by consanguineous marriages into 250 families, numbering some 5,000 individuals, whose continuous criminal record has poured over the Northwest a flood of imbecility and crime." Nor do these instances stand alone. It is the salvation of society that at a certain stage of nervous retrogression nature appears to check further increase by making the most defective sterile and short lived.

The cost of human life through the insane each year is very large. Professor White, late of Cornell, places the number of homicides in the country last year at over 10,000. How many of these are due to insanity I will not pretend to say, but almost daily we read of suicides preceded too often by the death by violence of one, two, or even five or six people under circumstances which appear hardly consistent with normal mental balance. So frequent have such affairs become that only when some one of more than ordinary standing becomes the victim do they excite more than temporary local interest or arouse us to the danger which may be very near us.

The remedy for this state of affairs is a subject which demands earnest thought and radical measures for relief. The evil is so wide spread, so thoroughly grafted in the every day life of society that to think of its immediate or entire suppression would be folly. It is time to attack the evil in some quarter. We can not expect relief from purely medical means. No more hopeless disease exists among the more common maladies than epilepsy in the adult. The relatively small number of "recoveries" in hospitals for the insane would be diminished if we subtracted the number who are committed to recover from alcohol, and other such cases who go out only to find their way back to some hospital later. Officers of institutions for imbeciles no longer look for restorations to normal brain power in large numbers, and even in such cases as leave the institutions there is a fear that their places may shortly be claimed by their children. He knows that the chief value of his work lies in the knowledge that the high grade imbecile is safer and the low grade and idiot more comfortable than he could be made at home. That he has relieved other children of association which would work harm and no good. He has relieved the family of an expense which deprived the other members of their due and the mother of a burden often too great for her. More than this, by enabling one person to care for perhaps five of these children, five families have been able to turn their entire efforts to ordinary social duties unhampered by such a burden as an imbecile child. Moreover, defective imbecile children should become the wards of the State until the danger of child-bearing is past. It is not so important with males. I need not explain why girls with strong animal passions and low mental or moral powers need such care.

It seems strange that our marriage laws should be so lax. The marriage of the unfit goes on unhindered. The epileptic may marry his kind and reproduce more of his kind. The drunkard, from a body thoroughly diseased, may cause any number of defective children to become public wards to be supported by the more self-respecting and industrious. There is no legal preventive against the man whose father and grandfather have been insane, and who has been, at some time, insane himself, from marrying a woman similarly afflicted and charging the bill to the public. The lunacy law of Pennsylvania expressly provides that a patient while still insane may go home for stated periods to resume all his family relations. It is time for a radical change in this condition of things. The excellent example of New York should be followed in other States and more accommodation provided for mentally and morally incapable women and girls. More stringent marriage laws should be enacted and enforced. The need of some such law was most strongly impressed upon my mind during my frequent observations of the mothers of feeble-minded children, so many of whom, though not feeble minded were surely close to the line. So many had a different name from their child's, from remarriage. Possibly the fathers were the same, but this was not so evident. In one winter, out of five children who died consecutively, four of the mothers had contracted a second marriage. One woman who was said to be the mother of six microcephalic imbeciles, and had two of them in our care, once visited us and announced her intention of contracting another marriage. It is a well-established fact that a mother who has had a microcephalic child is liable to have any successive children similarly marked.

So long as this evil continues it is difficult to see how we can stop the constant increase of this class. Such marriages should be legally prohibited. While

women, in every way fitted to fill the post of wife and mother, hesitate before the responsibilities such a position entails, these women should not be allowed to assume such duties as they can never properly fill, at so great a public cost, for the mere gratification of animal instinct or a prospect of support. Such a law would not be unjust. The right of society to control all powers which militate against the general good ought not to be denied, and such a law judiciously applied would work no material hardship and interfere with no one's just rights. The marriage of an epileptic is a crime. It is almost absolutely sure to result in the birth of human beings foreordained to a lifetime of suffering.

On whom does the responsibility of righting these wrongs fall more heavily than upon ourselves. No one understands so well as we how surely the fruit follows the seed in these matters, and no one's word would have the same weight in molding public opinion to force proper legislation to this end. The marriage of the unfit should subject the perpetrator to punishment as surely as would any other offense against the public peace and morals. The whole body of the intelligent public would agree with us in this matter. The clergy would endorse such a move, perhaps excepting a few who are entirely unworthy of the vocation they have assumed, who disregard the divine warning that the consequence of the father's sins shall surely descend to the children and cheerfully assist, for a marriage fee, in perpetuating the evil.

These two measures, of providing safe and comfortable homes for the weak and preventing in some measure marriage among those who can only perpetuate and increase human suffering, poverty and crime, fall far short of fully solving the question, but they have the advantage of being practicable, and furnish, so far as I can see, the only radical method of presently reducing this class to its minimum number, for it truly attacks the evil at the root. We can not abolish human weakness and sin, but we can deprive it of the seal of the State and the Christian church.

HYGIENE VERSUS DRUGS.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5–8, 1896.

BY C. F. ULRICH, A.M., M.D.

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The American people have been called a medicine-taking nation. If the quantity of drugs prescribed by physicians, the masses of patent medicines, the barrels of so called home remedies, such as teas, decoctions, infusions and other monstrosities, swallowed by the American people, were ascertained, collated, arranged and published in a book, it would strike the reader dumb with astonishment. The fact that any human body can survive the injection of such an endless variety of vegetable, animal and mineral poisons as are poured into the patient and unresisting stomach and thence distributed throughout the various channels, acting upon the digestive organs, the circulation and the nervous system, proves that man is indeed "fearfully and wonderfully made," and has much greater powers of resistance than we would believe possible.

Let us suppose that an individual has what is commonly called a cold, which may be catarrh of the pharynx, the tonsils, the larynx, the trachea, the bronchi; it may even be an incipient pneumonia. This person tells his or her suffering to a neighbor, the neighbor replies: "Oh, I had that, and I took such and such medicine." Immediately the article is procured and taken. Another one comes in, hears the tale of woe, and recommends something else, this also is duly swallowed. By the time the gauntlet of the whole neighborhood has been run, and the entire catalogue of the domestic and the proprietary pharmacopeia has been exhausted, the patient has either recovered by virtue of his good constitution in spite of the horrible dosing, or the disease has progressed to a dangerous stage. In the former case, the wisdom of the neighborhood gossips or the excellence of this or that patent medicine is lauded to the skies; in the latter case the doctor is called in and is told they have given the patient everything that everybody recommended and having failed, they now call him in to try his skill. Thrice happy is the poor doctor if these busybodies have left enough constitution and vitality in their unfortunate victim to give him even a faint prospect of working a cure. If, however, owing to the exhaustion of the vital powers, or the general subversion of all the functions of the body by the heavy, indiscriminate and absurd dosing to which the poor sufferer has been subjected, the doctor fails to cure him, all the vials of wrath will be poured upon his devoted head by the would be doctresses in the neighborhood. If he thinks the patient requires rest from drugs and gives nothing, he is promptly discharged and another one called in, who will come up to their standard of excellence by ordering some kind of medicine to be taken every hour, or oftener. I have frequently been told when presenting a bill that certain visits should not be charged for, because I did not make the patient take medicine on those days. My answer would be that it required as much medical knowledge to determine when medicine is unncessary as to know what remedies are required. It has often been suggested to me by my patients, or their families, that it is not necessary to come every day, but to return about the time the medicine is exhausted, in order to prescribe more. It does not occur to these individuals that the physician's duty is to watch the course of the disease, note its changes, assist nature in her efforts to bring about recovery, prescribe suitable remedies against unfavorable tendencies; in short to act as a kind providence to watch over the patient and promote recovery. They imagine the physician's business is to pour all sorts of drugs down the poor patient's throat and keep him constantly saturated with medicine. While engaged on the preparation of this paper, I visited one of my patients in the afternoon, whose medicine was exhausted in the morning. I found the family in terrible trepidation because he had not been dosed for six hours. The fever having abated, the temperature normal, the pulse regular, the patient free from pain, he was all the better for getting a little rest from drugs; but the family had suffered agony on account of my coming so late, and were on the point of sending a messenger to my house to inquire what was to be done. It is often necessary to prescribe a placebo in order to retain the patient. The physician who studies nature carefully, who makes himself thoroughly acquainted with the physiologic and pathologic processes of the human organism, acquainting himself with all the changes that take place in the interior of the body, both in health and disease;

giving the proper remedy at the right time and refraining from the administration of drugs when nature is doing the work for him, will be successful where success is possible; although he may sometimes confront the prejudices or the dense ignorance of his clients, and thus lose caste with some of them; but in time, it will be better, not only for the patient, but for the physician himself.

I can call to mind very many families who had abandoned me for some new and more complaisant physician, who would prescribe large quantities of drugs, resort to a variety of mechanical methods, that he represented as new, convincing the family thereby that he possessed more knowledge and skill, who finally became disgusted with the meddlesome activity of the new man and returned to me, saying: "I like the old doctor best after all." Having said as much as is necessary about the pernicious abuse of drugs, let us see what we can offer as a substitute. Hygeia, in the ancient mythology, was the goddess of health. We call this divinity Vis Medicatrix Naturæ, the healing power of nature. To the diligent student of nature and of physiologic processes in the human body, this divinity, Hygeia, assumes a greater importance than is generally attributed to her by the young and inexperienced practitioner. In a paper read at San Francisco in 1894, entitled "Cleanliness the Chief Antiseptic," I endeavored to show that the earnest and continued effort to prevent the development of bacilli and their entrance into the human organism, is of much more value in promoting health than the effort to destroy them after they have been introduced, or to relieve the system of the disease caused by their presence. This is the first consideration in the study of hygiene, which was fully discussed in that paper. But, as every physiologist knows (and every physician should be a thorough physiologist), there is a very complete apparatus in the human system to carry off, not only the waste material in health, but to dispose of the results of abnormal processes and of disease caused by the introduction of malignant bacilli. This consists of the various emunctories, as the large intestine, assisted in part by the entire alimentary tract; the urinary apparatus, *i. e.*, the kidneys, the ureter, the bladder, the urethra; the skin with its system of transpiration, *i. e.*, the sudoriparous glands and ducts. Now, although physicians know all about these, the masses are ignorant of the importance of keeping these emunctories in order, and many physicians are inclined to be careless in this direction. Bacteriology, antisepsis and abdominal surgery have so engaged the attention and called forth the enthusiasm of our modern practitioners, that the good old custom of investigating the bowels, the kidneys and the skin is often lost sight of. How much misery and suffering might be avoided, what an enormous quantity of patent pills and other purgative drugs would be rendered useless, and the sums of money wasted on them might be devoted to making the family more comfortable, if proper attention were paid to keeping the intestinal tract in good condition, which could be done without taking pounds of pills or swallowing gallons of medicine, by simply adopting a sensible and hygienic system of diet, by observing proper times for attending to the calls of nature, by never allowing other avocations or a false notion of propriety to interfere with the performance of that most important function. How much kidney disease might be averted by only introducing into the stomach such liquids as contribute to the preservation of the proper relations between the solids and fluids of the body. Here some one asks the question: "Shall we live like the beasts of the fields, drinking nothing but water? Shall we not pay some attention to the taste which nature has bestowed upon us, and enjoy the pleasant beverages with which the world abounds?" I do not propose to be so severe; you may enjoy the pleasant beverages that nature, assisted by the art of man, furnishes you, but you must practice moderation; you must become acquainted with the capabilities of your organization; you must study the effect of these beverages, and stop before the point of deleterious influence is reached. When you see a man suffering from that deadly malady, Bright's disease of the kidneys, take it for granted that he has abused that great organ, whose function it is to rid the body of worn out and dead material. It is a very patient and long-suffering organ, that will submit to an immense amount of abuse; yet there is a limit to its endurance and it must eventually succumb. The skin, an important auxiliary to the kidney, can be kept in a healthy condition by attending to hygienic rules. If we promote perspiration by reasonable and moderate exercise, and by keeping the pores open through frequent ablutions, we will find much poisonous material carried off that the kidneys would fail to dispose of. If these two organs, the kidneys and the skin, are treated according to the rules of hygiene, much disease will be prevented and the taking of enormous quantities of drugs avoided. The stomach, that great work-shop, in which the first stage of converting food into tissue is accomplished, is as much abused as the kidneys and the skin. All kinds of incongruous, indigestible and injurious articles, under the false name of food, are forced into the long-suffering and much-enduring stomach; indigestion or dyspepsia, which brings in its train so many other ills, is the inevitable result. This was for many years the prevailing disease of the American people, causing them to be distinguished by their sallow complexions and pinched features. The consequence is that the sufferer, not knowing what is the matter with him, resorts to all kinds of absurd medication, throwing the entire machinery of the body out of gear, thereby damaging the intellectual faculties and ruining the disposition. There is not a more unfortunate creature in existence than the chronic dyspeptic, a source of misery to himself, to his family and to all who come in contact with him. Now, how is this to be prevented? Not by filling the stomach with drugs which, in many cases, act as a foreign body, or even as a poison. It can only be avoided by learning the requirements of the system, the ability of the stomach to dispose of the ingesta, and the peculiar characteristics of the food to be supplied. Another thing to be avoided is the unhealthy habit of bolting the food to gain time for business, neglecting mastication, an essential process in digestion, and swallowing the too often unhealthy food with such rapidity that it forms at first an inert mass and afterward ferments, producing gastralgia, acidity of the primæ viæ, with a long train of disastrous consequences. This is perhaps the most important branch of hygiene, and should be studied by every parent and by all the children old enough to understand it. The hygiene of drinking-water has been sufficiently discussed to require no mention here. Already intelligent housekeepers are filtering and boiling their drinking-water, and the

remarkable absence of typhoid fever in our city shows that this reform has borne good fruits. The hygiene of the lungs, the heart, the liver, etc., would require space enough for another paper; hence the examples given must suffice.

The question may be asked: "What has all this to do with State medicine?" The answer is plain: Give all your working men and women, your employes in stores, offices, factories, etc., ample time to consume their food leisurely; let none but healthy teachers be employed in your schools; require every teacher to be well versed in the elements of physiology and hygiene, and require them to teach these branches to the children who are old enough to understand them; devote a reasonable amount of time in the schools to physical culture; require the teachers to inculcate general rules of health into the minds of the pupils. Another thing I would recommend: Let schools for hygienic cooking be established at the public expense, to enable poor people to enjoy healthy food as well as the more prosperous. Much of this can be accomplished by intelligent legislation. If the rules barely hinted at in this paper be carried out by the more intelligent part of the community, and taught by precept and example to the masses, the unreasonable consumption of drugs will be reduced to a minimum, and the health, prosperity and happiness of our people will be more than doubled in a few years.

PREVENTION OF SMALLPOX.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, held at Atlanta, Ga., May 5–8, 1896.

BY ELMER LEE, A.M., M.D., PH.B.

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It is not my intention to rudely characterize the world-wide process instituted by Jenner just one century ago, as either inefficient or a failure. As there was more than one road which led to Rome, it may be that there is other than one method by which a given disease may be prevented. It was 100 years ago, on the 14th day of May, that the English physician perceived the effect of a slight accident and gave the world the deductions by which vaccination with cowpox, made his name forever to be remembered, and rendered universal aid to the people. It has not been in my power, personally, to inaugurate experiments for determination of the correctness of conclusions concerning prophylaxis by vaccination; indeed, it is the privilege of few physicians, to know the exact facts by personal knowledge. It is not my purpose to question the validity of the statistics which are prepared for our guidance on this subject. There are some physicians both in America and Europe who have expressed a doubt concerning the efficacy of prophylactic inoculation. Their sincerity and privileges of investigation have undoubtedly been equal to the majority of the physicians who may take an opposite view.

The reason that the paper on this subject was prepared for this occasion, was suggested by the near at hand centennial of our great confrère. This meeting of the ASSOCIATION is, practically, a memorial to one whom the world loves to cherish, and whom physicians are willing to honor. The first thought on the subject was to prepare an address relating to the treatment of smallpox, but owing to the relationship which exists between this Section and myself, a paper suitable for that Section was suggested.

The origin of smallpox is unknown, at least, it is not recorded. The first recognition which is authentic, of the appearance of this disease dates only to the sixth century, in Europe. Undoubtedly it prevailed among nations during the earlier centuries, but owing to imperfect classification, as well as defective records, recognition is lost. The unwritten history of the disease is probably co-equal with the age of our race.

Its propagation is by two methods, namely, contagion and inoculation. The first is the most important and far reaching. Of what this contagion consists our senses fail to grasp. The active principle by which the attack is produced is not able to be encircled by either scientific processes of detection, or the highest development of the senses. Whether the contagious influences are transmitted to the air passages or to some other vital organ, it is surpassing strange that, up to the present time there is no means of detection. We know full well the pathologic order of the symptoms of the body which has been invaded. Precision of the successive steps in the development of the disease marks the course of every smallpox patient. It has been my privilege to note the physical expressions of variola by clinical experience. It seems to me that there is no disease so exact in the regular order of symptoms as the one under consideration. Once having mastered the knowledge of the diagnosis of smallpox, it is an acquirement which is never lost. The fever and the characteristic pain in the lumbar region, or the back of the head, with the rapid appearance of the papules, the vesicles and pustules, make it a picture never to be forgotten. This much is certain, that smallpox is a systemic disease and whatever process leads toward prevention is necessarily that which best preserves the general economy.

Vaccination by the use of smallpox lymph creates some alteration in the animal body which is beyond the keenest sense of man to determine. Analysis of the fluids and solids, by the highest scientific processes reveals not the secret wrought. It eludes investigation, and is analogous to and the parallel of electric display. We do not know the condition, only the effect. There is no perceptible difference except by a knowledge of the result between the wire carrying the electric influence and the uninfluenced wire.

Inoculation also produces smallpox. This is a rare form by which the disease is contracted. It is easy to understand the relationship between the introduction of the virus into the circulating fluid, and its effect, but it escapes our keenest perception to explain disease from contagion. As inoculation is rarely the actual cause in the production of smallpox, measures of prevention against it need not occupy our consideration.

Smallpox preys upon all races regardless of geographic separations, it does not spare the young or the old. There are some individuals, however, in whom there is some prevailing condition by which they are rendered insusceptible to the disease. Whether vaccinated or not, their exemption from attack is perfect. Could we but know with scientific accuracy the precise peculiarity and state of the power of resistance in such presence, it would afford data upon which to base absolute measures of protection

or others. My own opinion as to what constitutes his immunity will be explained presently. Negroes, especially those who inhabit warm countries, are disastrously affected by this disease. Generally speaking, one attack of smallpox precludes a second; but the rule is not invariable.

Vaccination, as is known to all of us, is the introduction beneath the skin, of a minute portion of lymph from the vesicle which is produced by inoculation of some lower animal with the virus of smallpox. A disease similar to smallpox in man is natural to cattle. The origin of vaccination sprang from the incident by which the maid who milked the cow received into an abrasion some of the cowpox virus, and thus became immune to the disease which ravaged the community. It was Dr. Jenner's part in this drama of life to discover the relationship between cause and effect, and give a world-wide significance to the incident of the milkmaid, and the humane service which she performed. The protecting influence of vaccination is regarded as acting in two ways. The first assumption is, that to him who is inoculated, protection against the disease is sure to follow. The second, that if the individual contracts smallpox, its duration and severity are lessened. These positions are reasonable and upon the same line of thought my plan for prevention of smallpox is now to be, for the first time, presented for your consideration. It is the desire at this moment to state that my preventive proposition is founded upon a process of reasoning from analogy. There are no cases reported by which the position is sustained, and it may be that there never will be; but in my own mind the conviction is established that whatever measures we are able to secure, to preserve a perfect health of the body, are necessarily, a prevention of disease, even the disease of smallpox. My views take two directions. First, the natural agent which is able to preserve immunity, and second, a method whereby, the prophylactic measures can be made practicable. It is sometimes a long step between that which is useful, and that which is able to be used. The distinction may be the insurmountable difficulty in the present instance, but it is certain that one step in the plan is sure to find a sympathetic response from modern sanitarians.

Uniform and stable health is maintained by preserving the quality and parity between the solids and fluids and between the supply of new material and removal of the old. This is the quadrangle and within its four sides the processes of life and health are protected. Water is the controlling factor of the organized human body. More than three-fourths of all the structures are water; 80 per cent. of the blood is water; seven-eighths of the brain and nervous structures are water. The preservation of the integrity of the soft structures depends upon water. Insufficient water results disastrously to the cellular tissue of the vital organs and to the physiologic function of those organs. It is a maxim of health, that impairment must precede invasion by disease. If it is possible by any universal agency such as water to practically prevent impairment of the system then it is able to say that water, when used rightly, may be a prevention of smallpox. The knowledge of the proper use of water is not generally understood or employed. A brief reference to physiology teaches, that two liters of water or its equivalent is required to maintain physiologic equilibrium each day. There are but few people who are aware of this requirement and fewer still who practice it. My theoretic prevention of smallpox, other than by vaccination, is the physiologic use of water introduced into the system through the mouth. Does it not appear as a reasonable proposition that if water constitutes so large a portion of the tissues and of the fluids and solids of the body, then, according to the laws of nature if that relationship is persistently disturbed, a condition suitable for disease is established? Such is my conclusion based upon over four thousand clinical experiences in the use of hydriatics.

The second element of the proposition is how to make the first practicable. It would be my suggestion, first: that the United States government should speedily enact a law creating a bureau of public health, the commissioner of which shall be an officer of equal rank with those of the other present existing departments. Wise and sound measures of public health can be authoritatively disseminated among the people, only through a national department at Washington. As a direct means of prevention to the whole population, public baths for all classes and both sexes should be provided. At these public institutions there should be provisions made for supplying pure, soft water to drink. In each establishment permanently maintained printed instructions should adorn the walls concerning the physiologic daily uses of pure water. Circulars of information should emanate from the national department, plainly and in straightforward terms of simplicity, explaining to the people the value of water drinking, also the injury resulting from its neglect. The use of public baths should be included in the instructions. It is not the fault of the masses of the common people among whom smallpox principally prevails, that such measures of prevention are not employed.

Recently a private patient informed me that since his youth the average daily consumption of water had been so small that the quantity could not be remembered. As a result of his ignorance and neglect, while yet about 30 years old, his appearance resembled that of a man between 40 and 50. The stay of a month under treatment at the hospital revealed to him the value of the use of water internally, and gave him encouragement for improved and prolonged life. There is a wide difference between so-called hydropathy and true physiologic hydriatics. In formal treatises on hydropathy reference is especially made to external use of water, whereas, the essential principle underlying the views entertained and expressed by the author regards the internal use of the proper amount of the proper kind of water as of first importance. The use of the bath is a refinement and is to be encouraged by providing public establishments throughout the whole world, and in these public establishments may be easily and naturally taught the higher value of the internal use of water. At the same time the harmful and sad consequences of the abuse of alcoholic drinks could be successfully explained.

Finally, the prevention of smallpox, by other means than by vaccination, is by the physiologic uses of pure, soft water; and secondarily, the provision of a national bureau of public health and the construction of public baths for the use of the common people.

103 State Street.

DISCUSSION.

DR. COCHRAN—If a man were perfectly healthy would he be

equally resistant to the poison of scarlet fever, as the gentleman maintains he would be to the poison of smallpox or to the poison of diphtheria or strychnin, arsenic or any other poisons that we know of? I think not. I think water may be made to supply a very important part in the prevention of smallpox, but I think it is very hot water applied to the bedding and surroundings of the man who is sick, and not cold water taken internally. I expect if there is any attempt to celebrate Jenner's Day, there will be ample time to discuss this question. But I suppose from what I have heard that it is quite possible to prevent the spread of smallpox without vaccination or inoculation. Put a man under quarantine; smallpox does not fly through the air like a bird and attack people at a distance. It will not cross an ordinary street under ordinary circumstances, unless it is carried across. I have had large experience with smallpox. There is no doubt about the prophylactic efficacy of vaccination. You may vaccinate a number of men and place them in a smallpox hospital and if the vaccination is properly done none of them will have smallpox. It is a very curious thing, an item that went around among the papers a few weeks ago (among others the JOURNAL OF THE ASSOCIATION) stating that there had been a very considerable outbreak of smallpox in the town of Gloucester, the county town of Gloucestershire. It was the town in which Jenner lived and made his experiments. He did not live in the town of Gloucester, but in the town of Berkeley; but it is a little strange that in the town where he made his discoveries there is an Anti-Vaccination League with a large number of members, and owing to their systematic neglect of vaccination this disease has come on them.

DR. KOBER—One remark might be a trifle misleading. In my experience in treating smallpox, which has been considerable, I have never seen vaccination done without good effect. I believe if taken two or three weeks, or a month, before exposure one may then be exposed and not have smallpox; but if taken the same day of exposure, notwithstanding the fact that it runs its course, that patient is likely to have a modified form of smallpox.

DR. COCHRAN—My experience was not similar to that. We had an epidemic of smallpox in Mobile in 1874-5, and having made close observation of the disease, I concede the statement of the gentleman that the disease is checked in warm climates is correct. Along the Gulf coast during the summers smallpox will almost die out. When the weather turns cold in the fall the number of cases increase and continue to increase until the weather becomes warmer in the spring and then they diminish. At one time it prevailed continuously for ten years, and I made a table showing the mortality for three months; as the mercury fell in thermometer the smallpox increased among the people. Black races are very much more liable to smallpox than the white. Prior to this epidemic I speak of, very little had been done in the way of vaccination for many years. There were 450 cases when we took charge, and we had to work very energetically, and use a great many agents that had never had smallpox, nor had they been vaccinated, and we vaccinated them at the time. The general result was that those who were vaccinated nearly all escaped.

DR. MCDANIEL—We naturally are controversial, but when we try our best to agree it sometimes seems impossible. There was one remark made by Dr. Lee that I can not exactly understand. If I understand you, Doctor, you say that when we are healthy, perfect health would protect from smallpox. Do you take that stand?

DR. LEE—Yes sir.

DR. MCDANIEL—I desire to say that I appreciate his paper very much, but I believe that smallpox is a specific disease, and I believe that you will all agree with me. I believe that vaccination is a specific remedy for that disease, and if it be a specific remedy I do not see how it can confer a more perfect health on the individual than he had before he was put under the effect of vaccination poison. For instance, the results from vaccin virus are sometimes very severe. There has been a fatal case lately in our midst. In the convalescence from this extreme illness so produced, the patient is absolutely protected from an attack of smallpox. It can not surely be because he is on a higher plane of health at that time than before the vaccin ordeal was encountered, because of his debility, and in that debilitated condition is perfectly immune from the smallpox. During the war I had charge of a Confederate recruiting camp; smallpox had been brought from Marietta, Ga., among our men, the raw recruits. There were 127 persons that were exposed to this case of smallpox brought from Marietta. In a few days it developed into an unmistakable case of smallpox; as Dr. Lee stated, the case was so characteristic that none could make a mistake after a few days. So I found on examination. All in camp were examined. Those who were unprotected, had no scar, were vaccinated. There were 118 out of the 127 who had the pitted mark; these I had disinfected, but of the nine others one had a scar that I could not approve; it had some signs of vaccination, but were not satisfactory. That man contracted varioloid, the other eight genuine smallpox. Out of the one thousand or more that I vaccinated, not one had smallpox.

DR. STONER, of Baltimore—During the past month a vessel came into port on which was a case of smallpox. The patient was put in quarantine on arrival at Baltimore, and everything thoroughly disinfected; after a few days' detention the immigrants were allowed to go. As an additional precaution the health officers were disinfected, and as a result there was no spread of the disease. The point I wish to make is simply this, that where a case is otherwise susceptible, if that person is vaccinated, the vaccination, if successful, would not be an absolute protection against smallpox. It would be modified to a very great degree, and might, in forty-nine out of fifty cases, prevent. My experience is that vaccination modifies to such an extent; that smallpox is not entirely prevented every time and varioloid occurs to a small extent. The point is that vaccination is not a preventive against it, still it is well enough to vaccinate to endeavor to keep a man from contracting it.

DR. QUIMBY—One word in reference to Dr. Lee's paper; it seems to me, as long as smallpox is a filth disease, if the caution is taken to destroy and put the surroundings in a good sanitary condition, then carrying out Dr. Lee's treatment, we certainly would have a preventive. Then use cold water inside and out and put everything in proper sanitary condition, because it is an insanitary disease, and if we dispose of the filth, we are freed from the germinating microbe that forms the disease.

DR. KOBER—I desire to be placed on record as opposing Dr. Lee. It seems to me, in the present state of our knowledge, that nothing short of vaccination and severe quarantine regulations can afford perfect immunity from this disease. In proof of this I will mention an epidemic which occurred two years ago in California, where the people enjoyed the best hygienic surroundings, in perfect health and blessed with the purest water and best food. The case of smallpox was introduced into the community from Chicago, a distance of over two thousand miles, and within a period of three weeks not less than fifty cases occurred in adjoining houses. All the hygienic conditions did not protect them from the disease, but as soon as sufficient quarantine and vaccination were resorted to the epidemic stopped.

DR. HIBBERD—He did not hold that the presence of pure water prevents, and if you do not use it, it is not a prophylactic.

DR. KOBER—But if they use the pure mountain water it should be considered a prophylactic.

THE WELFARE OF THE COMMUNITY DEMANDS THAT MARRIAGE SHOULD BE REGULATED.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5–8, 1896.

BY DANIEL R. BROWER, M.D.

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CHICAGO.

The closing hours of the nineteenth century are full of marvelous results in science and art, and of wonderful progress in medicine and surgery, but in the midst of these brilliant achievements may be seen on every side insanity, pauperism, criminality and the degenerating effects of various vices of nutrition so rapidly increasing that they will overwhelm the race unless they can be arrested. These melancholy effects are produced, at least in part, by the violation of the laws of heredity, constantly taking place in unregulated marriages. Under our higher civilization abnormal man, be he defective, dependent or delinquent, is propagated, cultivated and protected, his feeble and crippled offspring are nursed to manhood and sent forth to produce their kind. Under savage and semi-civilized conditions these abnormalities are speedily extinguished, the deformed and the weaklings have no place in their system, and some way or other are soon cut off.

The physicians, who have always been the advance guard of progress, ever watchful of the welfare of those entrusted to their care, must rise in their might, find the remedy and apply it to these defects of this brilliant age. The study of these defects of our civilization develop startling revelations.

First, consider the increase of insanity in Great Britain. In 1860 the proportion of insane to the population was 1 to 523, in 1870 1 to 411, in 1880 1 to 360, in 1890 1 to 320. The proportion of the insane to the population in New York to-day is 1 in 315. If this increase is to be stopped, it must be by the earnest efforts of such distinguished members of the profession as are gathered here.

Consider the question of crime. The census of 1890 places the criminals in prisons and reformatories at 82,329. If only one-third are incarcerated this gives a criminal population of about 250,000. Between the years 1850 and 1890 the population increased 170 per cent., the criminals increased 445 per cent. Between the years 1880 and 1890, the total population increased 24.5 per cent., the criminal population increased 45 per cent.

The statistics of pauperism show equally startling defects in our sociology. Dugdale, in his admirable study of the "Juke" family, shows how from one degenerate man, in seven generations there were developed 1,200 criminals and paupers. McCullock, in his history of the "Ben Ishmael" family, showed as the offspring of this degenerate, 1,750 criminals and paupers. Maudsley says that an idiot is not an accident, nor an irreclaimable criminal an unaccountable casuality. Our mental and physical condition is an inheritance, an estate in trust received from our ancestors; we make it better or we make it worse, and we hand it down to our children. Heredity, according to Ribot, "that biological law by which all beings endowed with life tend to repeat themselves in their descendants," is the great underlying factor, and yet, while we are extremely careful to observe its demands in the breeding of horses and cattle, we pay but little attention to it in laying the foundation for the physical, mental or moral condition of our children.

The laity need to be instructed on the subject; they should be taught that insanity, epilepsy, tuberculosis and drunkenness are all most certainly transmissable, and that out of them proceed pauperism and crime, and that he or she who possesses any one of these, or any other vice of nutrition, by marrying assumes a terrible responsibility in the suffering and misery they inflict upon their progeny.

Fortunately for the race these degenerates tend to extinction, and in the third and fourth generation, if not sooner, they have paid the penalty by annihilation, of their violation of the laws of nature.

Some of the laity are already deeply interested in this matter, and are seeking to find ways and means by which they may avoid these consequences; and the tendency to reversion furnishes us with the method by which the milder cases of hereditary taint may produce children who will but slightly inherit the abnormalities. We would, of course, advise such persons to unite in wedlock with those as far as possible removed from the vice of constitution which they possess, and then their progeny may be thrown back to the normal type.

The most perplexing, as well as the most active factor in producing the defects of our civilization, is alcoholism. The appetite for alcohol may be acquired, but it can be transmitted to the children, and various diseases and degenerations follow. Echeverria collected the statistics of sixty-eight males and forty-seven females who were alcoholics. The number of children born to them was 476. Of these, 23 were stillborn, 107 died of convulsions in infancy, 3 suicided, 96 had epilepsy, 13 were idiots, 19 maniacal, 7 had general paresis, 5 had locomotor ataxia, 26 had hysteria, 23 paralysis, 19 deformed, 9 chorea, 7 strabismus, 3 were deaf, and 205 exhibited drinking tendencies.

Dr. Tarnavskin examined at St. Petersburg prostitutes who had been inmates not less than two years, and found eighty-two per cent had parents who were habitual drunkards.

Boies[1] makes the statement, "that the consumption of distilled spirits, per capita, has not materially changed even in fifty years in this country, but the consumption of malt liquors has increased 738.1 per cent. contemporaneously with an increase of 445 per cent. in criminals in fifty years. These statistics show very plainly that the temperance reformers have not reached the masses. While the decanter is no longer seen on the sideboard, and the consumption of wine among the well-to-do people has diminished, yet the saloons are multiplying on every side. Surely we can not permit this condition of things to continue longer, and must recognize the inadequacy of the forces that are contending with it. The physicians must educate the laity, must impress them with a knowledge of the disastrous effects of alcoholism, and through their coöperation secure such legislation as will remove the blot from our civilization.

The effect of marriages, in disregard of the laws of heredity, are well shown in the following life trees. They are taken from Dr. Strahan's admirable book on "Marriage and Disease," and other sources.

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1 Prisoners and Paupers.

CASE I.

J. E——'s FAMILY.

M. A suicide. Aged 56. Married; no issue. | M. Died of cancer of stomach. Aged 66. | F. Died in a fit. Aged 54.

M. Died of cancer of stomach. Aged 58. Left five children.	M. Died of convulsions. Aged 13 weeks.	F. Died of consumption. Married several years; no issue.	F. Died of consumption. Married several years; no issue.	F. Died of consumption. Aged 16.	M. Healthy. has 7 children.	M. Epileptic. Twice insane. Testes in abdomen. Married. No issue.

CASE II.

K. S——'s FAMILY.

M. Epileptic. | F. Had sister insane.

M. Epileptic. Dead. No issue.	F. Epileptic and insane. Dead. No issue.	M. Idiot. Impotent.	F. Sane as yet. Nine children; some imbecile.	F. Insane; suicidal. Incurable. No issue.

CASE III.

Father a drunkard.

Son.

A drunkard; disgustingly drunk on his wedding day.

Died of convulsions.	Idiot at 22 years of age.	Suicidal. A dement.	Peculiar and irritable.	Repeatedly insane.	Nervous and depressed.

CASE IV.

M. Died mad.

M. Imbecile.	M. Irritable.	M. M. Died of brain disease.

F. Imbecile.	Epileptic.	Epileptic.	1 2 3 4 5 6 7 All seven died in convulsions.

CASE V.

F. A suicide.

M.	M. Insane.	F.	F.

Excitable.	Dull.	Epileptic. Imbecile.

CASE VI.

M. Mute. | F. Normal.

M. Mute. No issue.	F. Normal.	M. Normal.

F. Mute.	F. Mute.	M. Normal.	M. Normal.

M. Mute.

CASE VII.

J. G. A——'s FAMILY HISTORY.

	Paternal side.	*Maternal side.*
1st Gen.	Grandfather, a drunkard.	Grandmother, "odd."
	Grandmother, normal.	Grandfather, normal.
	Uncle, a drunkard.	Uncle, epileptic.
	Uncle, a drunkard.	Uncle, rheumatic, total cripple; and his daughter also.
2d Gen.	Uncle, an epileptic.	Uncle, rheumatic.
	Father, excitable and irritable.	Aunt, rheumatic.
		Mother, died in an asylum.
3d Gen.	Daughter, has had rheumatism and has heart disease.	
	Son, now insane.	
	Son, died a few days old of convulsions.	
	Son, now a chronic maniac in an asylum.	
	Daughter, suicidal melancholiac; died in an asylum; no issue. Family extinct.	

CASE VIII.

S. H——'s FAMILY.

M. Asthmatic. | F. Somewhat weak-minded.

1 Healthy.	2 3 4 5 6 Died in infancy in convulsions.	7 Drowned.	8 Epileptic.	9 10 Healthy.	11 Idiot.	12 Died in infancy in convulsions.

13 Healthy.	14 Scrofulous.

FATHER. Eccentric, hypochondriac.

M. Suicide. Age 40.	M. Suicide, Age 35.	M. Suicide. Age 30.	M. Suicide.	Normal.	F. Suicide.

—*Fulert.*

FATHER. Melancholia; died insane. | MOTHER. Nervous, emotional.

1 2 3 Died in infancy.	F. Melancholia.	F. Imbecile. One child, Deformed, Imbecile.	F. Suicide. 3 childen.	M. Imbecile. No issue.	M. Insane. No issue.	M. Insane. One child, Imbecile.

1-5 Die in Infancy.	6 Insane.	7 Eccentric.	1. Imbecile. 2. Dies of apoplexy. 3. An artist.

8 9 Marry. No issue.

—*Doutrebeub.*

FATHER Cancer. | MOTHER. Tuberculosis.

1 Died of lupus.	2 Died of pulmonary consumption.	3 Died of epileptiform convulsions.	4 Died of diabetes.	5 Died of cancer.

Dr. Richardson.

In the midst of these overwhelming exhibits, surely the welfare of the community demands that marriage should be regulated. It is horrible to contemplate what will be the condition of the race in the future, and what will become of our social and political institutions if this wholesale production of abnormalities does not cease.

In most of the States of the Union a marriage license is necessary before the ceremony can be performed, but its requirements are insignificant. Let us agree that in addition, proper evidence must be furnished that both parties are in good health, that they are not insane, criminals, paupers, alcoholic nor narcotic inebriates, that they are not tuberculous, cancerous nor epileptic, and that they have not active venereal disease.

If the members of this great profession will unitedly advocate this great reform, they will succeed, and more than ever deserve the title of public benefactors.

AGE AND SEX INCIDENCE OF MORTALITY IN MICHIGAN FROM DIPHTHERIA AND FROM CROUP DURING TWENTY-FIVE YEARS, 1870–94; A STATISTIC STUDY.

Read by title in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5-8, 1896.

BY CRESSY L. WILBUR, M.D.

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No apology is necessary at the present time for a statistic study bearing upon the history of diphtheria and croup in the United States during recent years. It is only a short time since the etiologic characteristics of the disease, or diseases, dependent chiefly upon the presence of the Klebs–Löffler bacillus and associated microörganisms, have been definitely ascertained, and a still briefer time has elapsed since the antitoxin treatment, based entirely upon modern bacteriologic research, has promised to revolutionize entirely the treatment, and to greatly reduce the mor-

tality of this, by far the most fatal acute infectious disease prevalent in this country, or at least its northern part.

It is of especial importance, therefore, in order that it may be known whether the claims of the new method of treatment are substantiated by experience, that reliable statistics of immediately preceding periods be available for comparison, and in case the employment of the serum therapy in any given locality appears to be attended with a reduction in the death rate from diphtheria, that it be known whether such reduction was probably caused by the special measures employed, or whether a reduction in mortality was reasonably to be expected as a consequence of the periodic fluctuations characteristic of the history of this and most other epidemic diseases.

Usually on the introduction of a new remedy, the appeal is primarily to the results of hospital treatment. This was necessarily so in the present instance, as the curative serum was costly and difficult to be obtained at first by general practitioners. Later, with increased facilities for its production and the undertaking of its preparation by official agencies, its use was more generally diffused, and an appeal could be fairly made to the testimony of the mortality statistics prepared by the general registry offices. Hospital statistics are notoriously unreliable, it being often impracticable to eliminate or fully describe the selective influences that determine the characters of patients and the results of treatment, as well as the preliminary diagnoses upon which the statistic conclusions largely depend. Small numbers are also usually employed, in themselves a frequent source of fallacy. In the deductions drawn from general mortality statistics, on the other hand, these minor sources of error tend to neutralize one another, so that any marked change from the usual course of a disease may, with considerable certainty, be ascribed to some extraneous influence.

Purpose of the present paper. — The data contained in the present paper are not presented in the interest of any particular method of restriction or prevention of diphtheria, nor, primarily, to illustrate the value of the antitoxin or any other method of treatment. If the serum therapy shall prove to be of as great usefulness as at present appears likely, valuable evidence as to its efficacy will probably be derived from the comparison of the incidence of mortality by sex and periods of age, as presented in this paper, for Michigan for the pre-antitoxin period, with corresponding data to be tabulated later for the "antitoxin era." If the antitoxin method goes the way of the Bergeon, Koch's tuberculin and other "fads," nevertheless the evidence here presented may be of special interest to the sanitarian and to all students of State medicine, from its bearing upon the history and success of the methods of prevention and restriction of diphtheria advocated and carried out by the Michigan State Board of Health under the able direction of Dr. Henry B. Baker. In any event it seemed to me that an impartial account of the prevalence of diphtheria in Michigan, and one as accurate as the available statistics would permit, would be of service in advancing our knowledge of this disease.

As indicated by the title, the discussion is confined entirely to the presentation of two features, with their inter-relations, of the mortality in Michigan from diphtheria and croup, viz., the distribution by ages in periods of years and by sexes of the decedents. It will be necessary to preface the subject proper with some general account of the history of diphtheria in Michigan as a whole, and its relation to the recorded mortality from this cause in other States and countries, in order that the position of Michigan in reference to the disease may be understood. Other important features of the recorded mortality are purposely excluded from the present discussion, *e. g.*, the geographic distribution through the State,[1] relative death rates of rural and urban populations, and monthly and seasonal prevalence, with relations to meteorologic conditions.

The study will chiefly show: 1, the availability of mortality statistics known to be imperfect in certain directions for use in certain other directions, as evidenced by the constancy and clearness of their testimony; 2, the characteristic differences in the age and sex incidence of diphtheria and croup, and, inferentially, the inexpediency of confusing their statistics under the term "diphtheria and croup" from a statistic point of view; 3, the desirability of ascertaining the causes, and so far as practicable, of preventing the increased relative mortality from diphtheria of female children on reaching the age of five years and upward.

Source and character of data.—The Registration Reports of Michigan are utilized as the source of information. This series of annual reports began April 5, 1867, and is continued at the present time in substantially the same form that it originally assumed. The method of collection of data is imperfect, being nearly the same as that of the United States census in non-registration States, *i. e.*, an enumeration of the facts some time after their occurrence. Many deaths fail to be registered each year, and the deaths in months near the date of enumeration are more thoroughly collected than those of months more remote from it. The result is precisely as in the case of the United States census mortality statistics of non-registration States, that study of the monthly and seasonal prevalence of mortality is entirely misleading, unless a graduated "correction" be applied to the monthly returns, something nearly or quite impossible to satisfactorily accomplish;[2] and, secondly, that the absolute rates for the year, both of aggregate mortality and of individual causes, are considerably below the truth. For the latter imperfection it has been necessary to make an approximate estimate, since otherwise we should have no means of judging of the relative mortality of the State as compared with other States and countries. In the Registration Reports of successive years up to the year 1890, amounts of deficiency, different for each year, have been calculated, varying from 66.24 per cent. down to 9.92 per cent. of the original returns, and giving an average "correction" of about 40 per cent.[3] There has been, however, no evidence whatever to show that the accuracy of registration has been any greater in one year than in another; indeed, the only condition of usefulness of the data presented, as employed for comparison of mortality in successive years, involves the assumption that the degree of imperfection of registration remained substantially the same from year to year

[1] For geographic distribution, see Michigan Registration Report for 1892, map opposite p. 195; the period is one of five years, 1888 to 1892, and diphtheria and croup are taken as one disease. See also the maps of diphtheria and croup (separately) in the Mortality and Vital Statistics Report of the Tenth Census, in which, however, percentages to total deaths, and not death rates, are shown.

[2] See Mortality and Vital Statistics of the Tenth U. S. Census, Part I, p. xl.

[3] Mich. Reg. Rep., 1891, p. 132.

This is the assumption under which the vital statistics of successive United States censuses are compared, and is, in fact, even more tenable as regards the Michigan statistics, since they have been collected under an unaltered law and by precisely the same registration machinery, at least since 1869. For this reason the writer has rejected the variable "correction" formerly employed in the reports, and has substituted since 1891, and employs in the present paper, an estimation—a mere guess, somewhat qualified by study of actual registered death rates of certain Michigan cities, and knowledge of the general rate of mortality of similar populations—that the returns of deaths in Michigan should be increased by about 60 per cent. to give the actual deaths that occurred. This estimate is probably sufficiently low, corresponding to an increase of the registered mortality from about 10 per 1,000 to an estimated actual mortality of about 16 per 1,000 population; is applied uniformly to successive years, and to the subdivisions of population, by sex, periods of age, etc.; and is only applied when the Michigan statistics are brought into relation with approximately correct rates of registration States or countries for direct comparison. For study of the *course of mortality*, the uncorrected rates, if only the assumption of their substantial uniformity of inaccuracy be granted, are as reliable as more complete ones.

Having stated the chief respects in which the Michigan statistics can not be taken at their face value, viz., monthly and seasonal distribution of mortality and absolute death rates, the following points upon which the results obtained from the Michigan returns are probably fully correct and reliable may be stated: 1, relative mortality from all causes and from special causes of death in successive years—the latter subject to the usual criticisms dependent upon defective diagnosis; 2, geographic distribution of mortality through the State; 3, proportions of deaths from specified causes to total mortality—this, however, a discredited ratio in vital statistics, although much used in the United States census reports in default of a better; 4, incidence of mortality by sex; 5, incidence of mortality by age. It is with the two latter features that the present paper is specially concerned, and it should be clearly understood that the admitted deficiency of Michigan registration in certain particulars in no wise affects the indications drawn from a large and fully representative mass of returns in regard to the facts of age and sex incidence of mortality from diphtheria and croup.

Statistic nomenclature and classification of diphtheria and croup.—The statistic study of a disease is necessarily secondary, in point of time, to its clinical study. It follows that uncertainty in diagnosis, confusion as to the true clinical and etiologic characters of a disease, or confusion of one disease with another, will be reflected in the vital statistics subsequently collected. The advances of knowledge in methods of exact diagnosis are shared, first, by the most progressive members of the medical profession, or possibly, by specialists in certain fields of investigation, in whose particular lines of research the advances were made; second, the rank and file of the profession adopt the discovery and it becomes a part of ordinary professional opinion; and lastly, the new knowledge filters through medical opinion and is more or less rapidly and thoroughly disseminated by the press until it finally becomes a part of the common belief of the people. It is from the people themselves, as a rule without the immediate intervention of professional opinion, that the data in regard to causes of death are collected in Michigan, and the foregoing considerations are given in explanation of the facts that they are apt to be somewhat indefinite in character and, further, that the returns of any year do not correspond to the latest professional knowledge of the time. There is in this an advantage, however, that the returns are not affected by the more transient waves of medical thought, but only by those deeper currents representing well-grounded changes in medical belief.

The vital statistics of Michigan do not extend back, by about ten years, to the time of the first general recognition of diphtheria in this country. It is probable that substantially the same clinical distinctions between diphtheria and croup have existed during the entire twenty-five-year period. The early confusion between diphtheria and croup, prior to the recognition of the "new disease," such as appears in plain evidence in the death rates of Chicago (Table 2), had been outgrown, and the recent tendency to report deaths from what would have formerly been considered "croup" or "membranous croup," as diphtheria pure and simple, has probably not affected the statistics to a very great extent, although it may be expected to show a marked influence in the next few years.

Bacteriologic analysis, by its proof of the Klebs-Löffler bacillus as the cause of true diphtheria, has laid the foundation of future exact statistics of this and related diseases. But we should not allow our statistic methods to outrun the actual advance of knowledge. While on the one hand, there is undoubted evidence that many cases of croup are diphtheritic in character and due to the infection of the Klebs-Löffler bacillus, it is equally positive that a certain proportion of them are not diphtheritic. Indeed, a certain fairly large proportion of cases of clinical diphtheria is found to be lacking in the presence of the essential germ, under our present methods of recognition, while in the undoubted cases of true diphtheria the action of the Klebs-Löffler bacillus is modified so largely by the presence of other species of microörganisms that the tendency is undoubtedly, at present, in the direction of a more minute analysis of true diphtheria, rather than to the inconsiderate consolidation of diseases possessing quite distinctive clinical, etiologic and statistic characters. Professor Novy of the University of Michigan well remarks, "That which for clinical or anatomic reasons is described as a definite disease, may in reality be far from be an entirety. . . . What was called a disease becomes, through the study of its etiology, a group of diseases. The old typhoid fever has passed through such a history, and we may say in advance that diphtheria has recently experienced a similar development."[4]

In the older Farrean classification of causes of death, as employed at present in the Massachusetts and Rhode Island Registration Reports, and in the Michigan Registration Reports up to the year 1892, diphtheria and croup are placed together, but separately, among the zymotic diseases. In the later classification adopted by the Registrar-General of England, and which is in use in most of the English colonies and in certain States of this country, croup

[4] Etiology of Diphtheria, Trans. Mich. State Med. Soc., 1894, p. 396.

is removed from its position in conjunction with diphtheria, and placed among the diseases of the respiratory system under the class of local diseases. This was undoubtedly a mistake, although made with the sanction of the Royal College of Physicians at the time (1883), for recent bacteriologic evidence makes it clear that a large proportion, perhaps at least 75 per cent., of cases of croup is in reality diphtheritic. The distinction made by the Italian reports[5], which place "difterite (crup difteritico ed altre forme difteriche)" under the head of infectious diseases, while "crup non difteritico" is put under the head of diseases of the respiratory organs, would be valuable, were it not certain, in the light of our present bacteriologic knowledge, that the practical distinction of non-diphtheritic from diphtheritic croup must have been quite impossible at the time this classification was adopted. The tendency at present, as evidenced by many European (continental) reports, and some in this country, is to combine the mortality reported from diphtheria and croup under one title, namely, diphtheria and croup, or simply diphtheria. Bertillon says, referring to his proposed statistic nomenclature of causes of death, which was presented to the International Statistical Institute, Chicago, 1893:[6] "It is very important for exactness of international comparison that the titles 'diphtheria' and 'croup' should always be placed side by side to facilitate adding the numbers; we prefer to combine them under a single title." This latter preference I can not but regard as unfortunate for the reason that such statistics of diphtheria and croup cease to be comparable with those of diphtheria and croup stated separately, as found in all reports following the present Registrar-General's classification. An even worse method, considered statistically, however justifiable it may be from the present bacteriologic and from a sanitary point of view, is the plan boldly adopted in the Chicago report for the year 1894, of adding bodily 80 per cent. of the reported deaths from croup to diphtheria. The rates thus changed become wholly incomparable with those of previous years, which should have been either changed in a similar manner, or, better, an additional column showing the aggregate mortality from diphtheria and supposed diphtheritic croup might have been given. "It is not the duty of a statistic office to interpret diagnosis (that is to say, to guess at what has been left incomplete). It can only register facts as they are formulated." (Bertillon.)

In the provisional classification of causes of death employed in the Michigan Registration Reports since 1892, I have placed the returns of diphtheria, croup and membranous croup side by side, in order that the summation or total deaths from diphtheria and croup, might be readily obtained, while at the same time the statistic integrity of each cause of death, as returned, remained unimpaired. The aggregate number of deaths registered during the twenty-five years from diphtheria and croup was 28,088, of which number there were 21,095 deaths reported as diphtheria, 5,897 as croup (otherwise unspecified) and only 1,096 as membranous croup. The very few cases returned as spasmodic croup are included under simple croup, while a few returned as diphtheritic croup have been compiled under diphtheria. So also are included under the latter head a few cases of "putrid sore throat" occuring during the early years of registration.

General prevalence of diphtheria and croup in Michigan.—Two tables are given in illustration of this subject, which show respectively the general importance of diphtheria as a cause of death during recent periods of years in certain European countries, Australasian colonies, and in the United States; and the course of diphtheria and croup as registered year by year in Michigan, compared with Chicago, Massachusetts, England and Wales, and the colony of Queensland.

TABLE 1.—Comparison of death rates per 100,000 population from diphtheria, and from diphtheria and croup in certain countries, states and cities during recent periods of years.

Country, State or City.	Years.	Rate per 100,000 population.	
		Diphtheria.	Diphtheria and Croup.
Europe.			
Austria	1887-91		132.0
Belgium	1887-91		57.7
England and Wales	1887-91	17.4	29.1
London	1897-91	32.3	
Cities, 28 largest	1890		24.9
France (cities)	1887-91	66.6	
Germany (cities)	1887-91		102.1
Cities, 28 largest	1890		92.0
Holland	1987-91	14.5	36.6
Italy	1887-91	60.8	70.5
Ireland	1887-91	7.6	23.7
Prussia	1887-91		141.7
Sweden	1887-91	38.9	52.0
Switzerland	1887-91		35.3
Australasia.			
New South Wales	1878-87		47.7
New Zealand	1878-87		24.2
Queensland	1878-87		47.5
South Australia	1878-87		59.3
Tasmania	1878-87		44.6
Victoria	1878-87		41.7
America.			
United States, registration States	1890	63.0	95.4
Cities, 28 over 100,000 pop.	1890		116.6
Massachusetts	1886-90	61.6	85.0
Baltimore	1885-90		80.1
Boston	1885-90		124.5
Brooklyn	1885-90		164.4
New York	1885-90		181.6
Philadelphia	1885-90		98.3
Washington	1885-90		59.6
Chicago	1885-89	119.9	170.7
Chicago	1890-94	72.7	100.3
Detroit	1890-94		164.0
Grand Rapids	1890-94		100.3
Michigan, as returned	1885-89	47.4	67.8
Michigan, as returned	1890-94	45.6	59.3
Michigan, as estimated	1885-89	75.8	108.5
Michigan, as estimated	1890-94	73.0	94.9

NOTE.—The data for Europe are from the *Statistica delle Cause di Morti*, Rome, 1894, and have been kindly revised by Prof. Richmond Mayo-Smith of Columbia College, from whose work, Statistics and Sociology, they were taken. The rates for Australasia are as given in the Victorian Year Book, 1894. The rates for the American cities during the six-year period, 1885-90, are from the special investigations of the Eleventh U. S. Census. The rates from diphtheria for Chicago are the means of the rates stated for the five-year periods in the valuable "Chronological Summary of Chicago Mortality, 1851-1894," forming a part of the *Annual Report of the Department of Health* for the year 1894. In obtaining the rates for croup from this Summary the writer nearly fell into error from the fact that the column in the statistics of this disease (p. 250) corresponding in position to the column of death rates per 10,000 population in all of the other tables, does not contain death rates, as stated by the general heading, but instead contains "percentages of total deaths;" it was necessary to calculate all of the rates given for croup in Table 2, and from these annual rates the means given above were obtained. For the Michigan cities, Detroit and Grand Rapids, reference was made to the table in the *Michigan Registration Report*, 1893, p. 248, the rates in which were based upon the deaths actually registered by the city health officers, and recorded in their monthly or annual reports.

Table 1 indicates the world-wide extension and universal importance of diphtheria as a cause of death.[7] Incidentally it shows the inconvenience in

[5] Elenco systematico delle cause di Morte, *Statistica delle cause di Morte*, 1885, p. LIII.

[6] Translated and appended to Report of Committee on Nomenclature and Forms of Vital Statistics made to the American Public Health Association, Montreal, 1894.

[7] Cape Colony has only just adopted a general registration system (Act of 13th July, 1894), so that data representative of Africa are not available. It may be noted, however, for certain cities and towns of Cape Colony the death rates from "diphtheria and croup" in 1894 were extremely high: Cape Town, 80.4; King William's Town, 83.0; Worcester, 92.5; Malmesbury, 162.5; Beaufort West, 179.1; Murraysburg, 382.8; Aberdeen, 398.4, all rates per 100,000 population. The antitoxin treatment has come into general use, serum being supplied to medical men free of cost.—*Cape of Good Hope Reports on the Public Health*, 1894, p. xxiv.

making comparisons arising from the fact that for some countries and cities rates for diphtheria only, in others for diphtheria and croup only, could be obtained. We notice that England and Wales, Ireland, Holland and Switzerland, show a low mortality as compared with other countries of Europe, that the prevalence in Australasia is light compared with Europe and America, and that the mortality in America is very high as a rule. The rates for the twenty-eight largest cities of the United States, Germany and England, are from the report made to the Eighth International Congress of Hygiene and Demography, Budapest, 1894, by the American Committee on Diphtheria. whose chairman was Dr. J. S. Billings, ex-Deputy Surgeon-General U. S. Army, editor of the "Vital Statistics Reports of the Tenth and Eleventh U. S. Censuses," and the foremost American authority on the subject.

TABLE 2.—Course of mortality from diphtheria and from croup—annual rates per 100,000 population—in Michigan, compared with Chicago, Massachusetts, England and Wales, and Queensland.

Year.	Michigan as returned.			Chicago.		Massachusetts.		England and Wales.		Queensland.	
	Diphtheria.	Croup. Membranous.	Croup.	Diphtheria.	Croup.	Diphtheria.	Croup.	Diphtheria.	Croup.	Diphtheria.	Croup.
1855					60.9			2.0	23.9		
1856					34.6			3.2	27.7		
1857					184.9			8.2	27.7		
1858					208.6	1	42	33.9	31.9		
1859				1.1	170.6	2	44	51.7	28.6		
1860				140.9	114.3	21	47	26.1	22.0		
1861				93.3	102.8	52	37	22.5	21.9		
1862				54.0	78.0	53	39	24.1	27.8		
1863				91.3	117.4	113	69	31.5	23.7		
1864				67.9	106.1	98	61	26.1	32.4		
1865				94.7	154.1	53	40	19.6	28.0		
1866				67.0	80.8	31	33	14.0	24.1		
1867				34.7	44.3	19	26	12.0	20.2		
1868				34.5	45.0	22	35	13.7	20.4		
1869				46.4	49.7	21	33	11.7	20.2		
1870	10.2	.3	10.5	53.4	81.4	17	29	12.0	18.1		
1871	9.9	.6	12.0	29.0	41.5	18	32	11.1	19.1		
1872	15.6	.8	12.1	40.3	55.3	18	31	9.8	15.7	27.8	30.2
1873	16.9	.5	12.8	24.2	35.0	19	28	10.8	18.3	52.1	43.5
1874	16.2	.7	9.9	19.7	22.3	31	25	15.0	21.1	30.3	35.5
1875	15.4	.8	11.3	31.2	34.5	73	41	14.2	18.9	36.0	38.9
1876	22.8	1.5	10.9	111.3	67.5	158	41	12.9	17.2	29.3	40.2
1877	40.1	1.3	9.8	77.4	54.9	158	33	11.1	15.8	22.6	43.6
1878	57.9	2.4	13.0	67.3	51.1	116	34	14.0	16.2	8.2	30.5
1879	93.3	2.8	14.7	122.9	78.9	101	33	12.0	14.1	11.7	21.0
1880	94.2	4.0	15.7	184.8	105.8	99	36	10.9	13.8	13.5	25.7
1881	122.0	3.8	18.7	112.8	73.7	94	32	12.1	13.8	12.7	39.8
1882	81.1	2.6	17.4	94.8	41.3	69	26	15.2	17.5	12.2	30.3
1883	56.0	2.9	15.8	102.1	21.5	58	28	15.8	17.2	14.6	40.3
1884	57.5	2.2	15.4	103.0	40.6	56	29	18.6	17.6	13.7	31.5
1885	55.7	2.4	15.4	106.2	46.0	51	27	16.4	15.6	27.3	38.0
1886	57.8	5.4	15.3	134.1	50.9	53	26	14.9	13.4	29.5	30.7
1887	47.4	5.9	14.3	131.8	52.9	55	26	16.0	14.3	26.5	18.3
1888	35.9	4.5	19.1	106.8	54.6	65	24	17.1	12.9	22.8	18.6
1889	41.3	2.2	17.4	120.4	50.0	80	22	18.9	11.4	22.7	18.9
1890	60.5	2.7	19.8	72.8	31.3	55	17	17.9	10.9	39.1	16.9
1891	49.7	1.6	11.9	76.7	32.0			17.3	9.1	38.8	11.9
1892	47.1	3.7	9.7	70.5	37.0			22.2	7.6	25.7	16.6
1893	43.5	1.9	9.8	60.9	30.6			31.8	7.1		
1894	28.6	2.0	6.1	82.4	7.3			29.2	5.8		

In Table 2 the fluctuations, but not the absolute rates, of the mortality in Michigan from diphtheria and croup may be compared with corresponding rates for Chicago, Massachusetts, England and Wales, and Queensland for successive years. These comparative data are chosen for their special significance. The course of the disease in Chicago, from its geographic proximity, may be taken as corresponding fairly closely to that in Michigan, but it extends over a longer series of years, in fact from beyond the first recognition of the disease diphtheria as such during the present period of prevalence. The high death rate from "croup" in 1858 and 1859, during which years practically no "diphtheria" was reported, together with the high death rate from diphtheria in 1860 attended with some decline of the rate from croup, are indicative of the confusion between these diseases which was present at its first outbreak. Until about 1875 croup had caused a larger annual mortality in Chicago than diphtheria as a rule, but since that time diphtheria has been the more fatal. It should be remembered that for 1894 the compiler of the Chicago statistics has taken 80 per cent. of the registered mortality from croup and added it to diphtheria, thus disturbing the true relations of these causes of death as returned.

Massachusetts was selected as a State fairly representative of the East, and because her system of registration is the oldest and probably the most perfect of any in this country. The data are from the Registration Report of 1890, the rates having unfortunately not been continued in later reports.

Besides the rates given for England and Wales as representative of European statistics of diphtheria, it would have been desirable to present a corresponding series for Germany or some other continental country, in which the disease is far more prevalent, as a rule, than in England. Unfortunately statistics were not at hand for this comparison, so that the general relations indicated in Table 1 can only be referred to as illustrative of the general European mortality from this disease.

The data for Queensland, which colony was taken as fairly representative of Australasian experience, do not extend back as far as would be desirable in order to show the early development of diphtheria as a cause of death in the Southern Hemisphere. They were, however, the longest series of death rates accessible to the writer, and have been taken directly from the annual reports of the Registrar-General of that colony. A complete file of the annual reports of New South Wales, beginning with the year 1857, completely covers the history of the disease, but, unfortunately, for the early years of registration the zymotic diseases are all grouped together, without stating separately the number of deaths due to each cause. The first mention of diphtheria occurs in the Report for the year 1864, but the disease had occurred to some extent during previous years, and had been tabulated as quinsy. An interesting table is given in the 9th Annual Report for 1865 showing the deaths annually registered from certain diseases during previous years, part of which is here given:

Deaths registered in New South Wales, 1856-64.

Year.	Scarlatina.	Quinsy.	Diphtheria.	Croup
1856	31	4		61
1857	38	4		38
1858	165	6		69
1859	120	50		85
1860	89	115		52
1861	70	158		74
1862	103	309		35
1863	95	51	239	142
1864	350	32	162	85

General age and sex incidence of diphtheria and croup in Michigan during the twenty-five-year period, 1870-94.—In Table 3 are given the condensed results of registration for twenty-five years as regards these particulars. About 85 per cent. of all decedents from croup were under five years of age, and about 13 per cent. were aged from 5 to 9 years. The proportions at more advanced age periods were insignificant. From diphtheria a smaller percentage of deaths occurred under 5 years of age (46.3 per cent. for males, 42.1 per cent. for females), about one-third of the total deaths was at the period of 5 to 9 years,

while the period 10 to 14 showed about the same proportion of deaths from diphtheria as the preceding quinquennial period did from croup. Nearly 8 per cent. of all deaths from diphtheria were of persons over 15 years of age.

The death rates per 100,000 mean population from croup are much less than those from diphtheria at every period of age except the first (0-4); the greater concentration of deaths from croup into this period raises the rate of mortality from croup to over 50 per cent. of that from diphtheria.

As regards sex, the marked distinction will be noted that croup causes more deaths of males, diphtheria more deaths of females. Comparing the death rates at each age period by sex (and thus eliminating the unequal distribution of the sexes in the population, which would affect the results if the numbers of deaths of each sex were only compared), we find that the proportion of death rates of males is higher than that of females for croup at all ages and during the quinquennial age periods, 0-4, 5-9, 15-19. For the period 10 to 14 a lower rate appears for males, while for ages over 20 years the rates are equal. There were only 102 deaths returned from croup over 10 years of age, so that the proportions above the first two periods of age should probably be rejected from insufficiency of data. Except for the first five-year period, during which the death rates of each sex are nearly the same, with a slight excess of males, diphtheria shows a markedly greater fatality among females. From 5 to 9 years of age about eighteen males die for every twenty females; from 10 to 19 about seventeen males to every twenty females, and above 20 years of age the disproportion is still greater, being at the rate of only about thirteen males to twenty females.

In both age and sex incidence, membranous croup is seen to occupy an intermediate position between croup, returned only as such, and diphtheria. Contrary to what might have been expected, the proportions, both by sex and age, appear to stand in somewhat closer relation to those of croup than to those recorded for diphtheria. It is therefore obvious that in the statistic treatment of deaths returned from "membranous croup," consolidation with croup is more desirable than consolidation with diphtheria, provided the apparent distinction between these two latter forms of return is to be maintained. This position leaves open the question as to whether all deaths from croup are not largely diphtheritic, the peculiar age and sex incidence of the former being due to clinical distinctions not borne out by bacteriologic criteria.

In any case, from the small number of deaths reported from membranous croup, we shall be justified in neglecting this item, and referring chiefly to the deaths reported as croup and diphtheria in the following comparisons. Also, for convenience, the series of five consecutive quinquennial periods from 1870 to 1894 is generally employed rather than single years. Rates of the average deaths in each period, carefully computed from the mean population, are used, not the means of the annual rates. Since only .4 per cent. of decedents from croup were over 20 years of age, and only about 3.5 per cent. of those from diphtheria exceeded 20 years, we shall be justified in grouping all decedents aged 20 years or over together, analysis by quinquennial periods of age being confined to decedents under 20 years of age. We accordingly have four consecutive five-year periods, viz., 0-4, 5-9, 10-14, and 15-19, the study of which is practically exhaustive for the causes of death under consideration. Indeed, it will be found that so few deaths are reported for croup above the age of 10 years, that only the data referring to the first two quinquennial periods are of value in the discussion of this disease.

TABLE 8.—Showing, for the twenty-five-year period, 1870-94, in Michigan: 1, the percentage of deaths, by sex, at certain periods of age, as returned from croup, membranous croup and diphtheria; 2, the death rates per 100,000 population of same age and sex from each disease; 3, the ratios of death rates of males to death rates of females at each period of age

Causes of death as returned 1870-94.	Sex.	Periods of age of decedents.					
		All ages.	Under 5 years.	5 to 9.	10 to 14.	15 to 19.	20 and over.
Per cent. of total deaths from each cause at known ages.							
Croup. . . .	Males. .	100.0	85.7	12.7	1.0	.2	.4
	Females.	100.0	84.9	13.2	1.4	.2	.4
Croup, membranous. .	Males. .	100.0	72.2	25.3	2.0	.2	.3
	Females.	100.0	73.3	20.7	4.3	.2	1.4
Diphtheria.	Males. .	100.0	46.3	33.4	13.0	4.1	3.1
	Females.	100.0	42.1	34.9	14.4	4.7	4.0
Rates per 100,000 population of same age and sex.							
Croup. . . .	Males. .	14.6	103.3	16.2	1.4	.3	.1
	Females.	12.7	83.8	13.7	1.7	.2	.1
Croup, membranous. .	Males. .	2.7	16.1	6.0	.5		
	Females.	2.4	13.5	4.0	.9		.1
Diphtheria.	Males. .	45.8	175.3	134.2	56.4	19.7	2.5
	Females.	52.2	171.4	149.3	67.1	23.3	3.8
Per cent. of death rates of males to death rates of females.							
Croup. . . .	. . . . .	115.0	123.3	118.2	82.4	150.0	100.0
Croup, membranous. .	. . . . .	112.5	119.3	150.0	55.6		
Diphtheria.	. . . . .	87.7	102.3	89.9	84.1	84.5	65.8

Sex incidence of diphtheria and of croup by years and quinquennial periods.—Sex incidence at all ages is shown in Table 4 for diphtheria, croup and membranous croup. Individual years are given as well as the results for quinquennial periods. With the exception of a single year, 1873, the death rates of males from diphtheria are lower than those of females; with five exceptions, 1874, 1884, 1889, 1893 and 1894, the contrary is true for croup. From the small numbers involved, the relations of the mortality of the sexes from membranous croup may be expected to present less uniformity, but on the whole the death rates of males are greater, as with croup reported without further specification.

In the last two columns of this table the ratios of death rates of males to death rates of females from diphtheria and from croup are stated, the death rates of the females being taken as a basis (100.0 per cent.) in each case. This form of expression, which eliminates the error incident to comparison of deaths of males and deaths of females as returned without allowance for relative numbers of each sex in the population, will also be used in Table 5 for comparing the relative mortality of the sexes from each disease at the different age periods. It will be called, for convenience of reference, the *relative male mortality.* (See upper part of diagram.)

The relative male mortality from croup was slightly higher during the last quinquennial period than during the first; it rose rapidly from 1870-74 to 1875-79, declined nearly as quickly as it rose for the next two periods, and rose again from 1885-89 to 1890-94. The relative male mortality from diphtheria fell slightly from 1870-74 to 1875-79, but has risen since that time. It must be remembered that these statements refer solely to the quinquennial periods as a whole; within these periods are many minor oscillations in the opposite direction to that of the general tendency of the ratios.

By age periods, it will be noted that the curve of croup, 0-4, corresponds very closely to the relative male mortality of croup at all ages, as should evidently be the case, since about 85 per cent. of all decedents from croup were under 5 years of age. The relative male mortality of decedents from croup aged 5-9 may be said to exaggerate the variations of the group 0-5, rising and sinking more rapidly than the latter, but moving in the same general direction.

The relative male mortality of diphtheria for the two periods, 5-9, 10-14, corresponds closely to the relative male mortality of diphtheria at all ages. That of decedents under 5 years of age moves in the opposite direction to that of the two following periods, but on the whole shows little variation. The age period, 15-19, as is generally the case when the aggregate number of deaths is becoming too small for reliable inferences, shows the most violent changes. The relative male mortality from diphtheria between the ages of 15 and 19, during the period 1885-89, exceeded the relative male mortality from croup at any age, something quite the reverse of the usual experience.

TABLE 4.—Death rates by sex, from diphtheria, membranous croup and croup, as returned in Michigan for each of the years, 1870-94; with rates for the quinquennial periods included, and for the twenty-five-year period. Also per cent. of death rates of males from diphtheria and from croup to corresponding death rates of females.

Years and periods.	Death rates per 100,000 population, by sex.						Per cent. of death rates of males to death rates of females.	
	Diphtheria.		Membranous Croup.		Croup.			
	Males.	Females.	Males.	Females.	Males.	Females.	Diphtheria.	Croup.
1870	9.1	11.5	.3	.2	11.5	9.4	79.1	122.3
1871	8.3	11.6	.8	.3	12.2	11.6	71.6	105.2
1872	13.4	18.0	.9	.7	13.1	11.0	74.4	119.1
1873	17.1	16.6	.9	. .	14.2	11.3	103.0	125.7
1874	15.5	17.0	.9	.6	9.6	10.2	91.2	94.1
1875	15.0	15.8	1.2	1.3	12.8	9.5	94.9	134.7
1876	21.4	24.3	1.2	1.8	12.8	8.9	88.1	143.8
1877	38.5	41.8	1.3	1.3	10.9	8.5	92.1	128.2
1878	49.3	67.4	2.5	2.3	14.1	11.7	73.1	120.5
1879	85.8	101.6	2.2	3.6	17.7	11.3	84.4	156.6
1880	86.3	103.0	4.1	3.9	17.2	14.1	83.8	122.0
1881	115.8	128.9	4.4	3.1	21.3	15.7	89.8	135.7
1882	73.1	90.1	3.2	2.1	19.9	14.5	81.1	137.2
1883	52.8	59.4	2.9	2.9	16.3	15.2	88.9	107.2
1884	51.5	64.0	2.5	1.8	14.6	16.3	80.5	89.6
1885	50.6	61.2	2.8	2.0	15.8	14.9	82.7	106.0
1886	54.6	61.3	5.6	5.1	15.3	15.3	89.1	100.0
1887	45.9	49.0	6.6	5.2	15.4	13.1	93.7	117.6
1888	35.4	36.4	4.4	4.6	20.3	17.7	97.3	114.7
1889	40.1	42.7	1.8	2.8	16.1	18.7	93.9	86.1
1890	57.1	64.2	3.5	1.8	22.3	17.1	88.9	130.4
1891	49.1	50.5	1.6	1.7	12.0	11.7	97.2	102.6
1892	46.6	47.5	3.7	3.6	11.4	8.0	98.1	142.5
1893	39.5	47.8	1.9	1.9	9.7	10.0	82.6	97.0
1894	27.1	30.3	2.1	1.8	5.8	6.4	89.4	90.6
1870-74	12.8	15.0	.8	.4	12.1	10.7	85.3	113.1
1875-79	43.2	51.6	1.7	1.9	13.7	10.0	83.7	137.0
1880-84	75.1	88.2	3.4	2.7	17.8	15.2	85.1	117.1
1885-89	45.2	49.9	4.2	3.9	16.6	16.0	90.6	103.8
1890-94	47.8	43.7	2.6	2.2	12.1	10.5	91.4	115.2
1870-94	45.8	52.2	2.7	2.4	14.6	12.7	87.7	115.0

Age incidence of diphtheria and of croup by quinquennial periods.—In the first part of Table 5 the ratios of deaths by sex, to total deaths at all ages from diphtheria and from croup are shown, for each of the quinquennial age periods studied, at each of the five-year periods of registration lying between 1870 and 1894. (See second part of diagram.) It will be observed that the lines representing the sexes are nearly parallel, thus showing that the influence exerted by the factor of sex at each age period is very nearly constant. The only exceptions to this rule are croup, 0-4, for the period 1875-79, and diphtheria, 5-9, during the last quinquennial period of registration, 1890-94.

The ratio of mortality from croup under 5 years of age to total mortality from croup at all ages is nearly double that from diphtheria at the same or at any other age period. Its course is nearly uniform, and averages about 85 per cent. for both sexes.

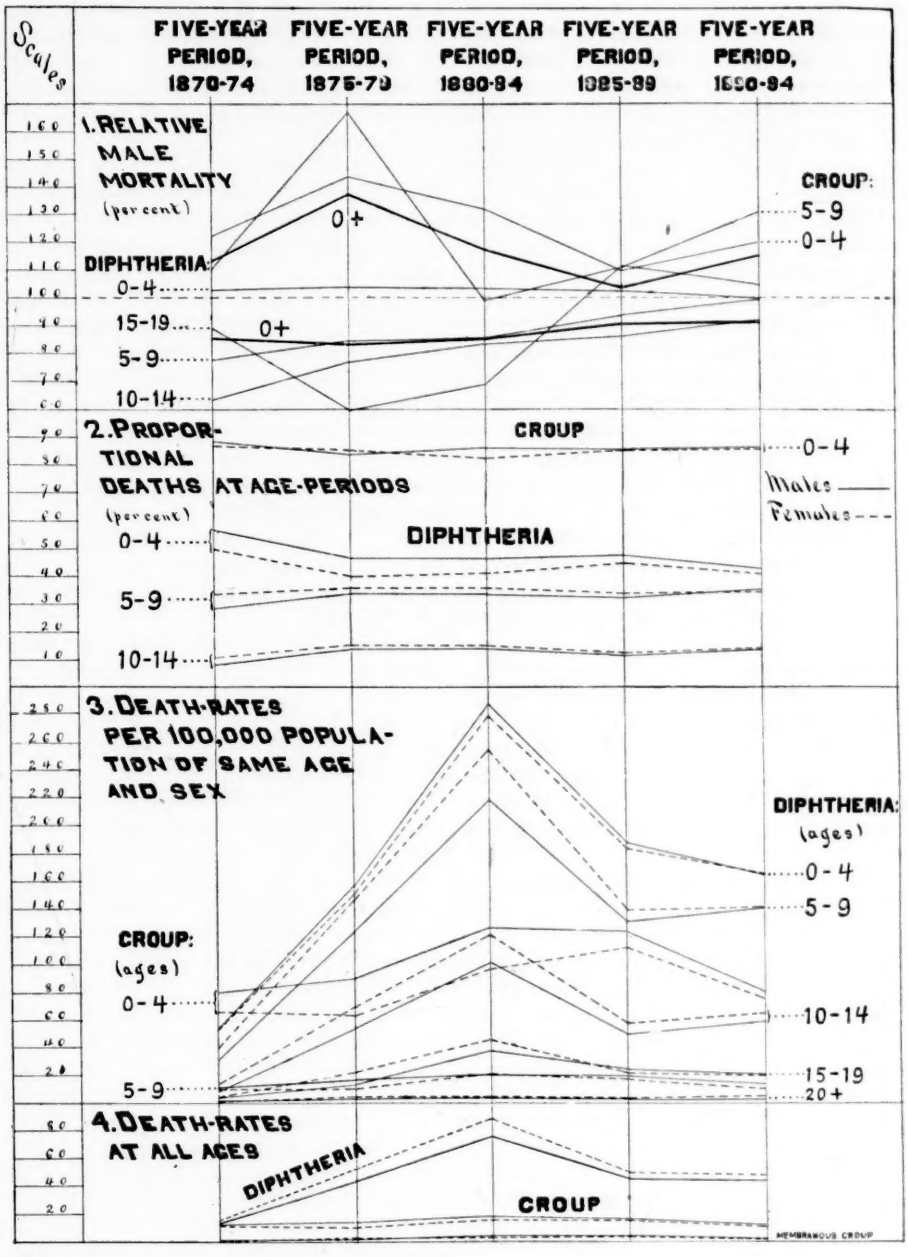
The curves representing the proportional mortality from diphtheria at the periods 5-9 and 10-14 are nearly parallel, and show a slight increase between the two most recent quinquennial periods. Both rose from 1870-74 to 1875-79, continued nearly stationary from 1875-79 to 1880-84, and declined together from 1880-84 to 1885-89. It is evident that the curve representing the proportional mortality from diphtheria in children under 5 years of age must exhibit changes of a compensatory character, that is to say, as appears after examination of the figures, the ratio of decedents from diphtheria aged 0-4 fell from 1870-74 to 1875-79, remained nearly stationary from 1875-79 to 1880-84, rose from 1880-84 to 1885-89, and fell again from 1885-89 to 1890-94.

TABLE 5.—Showing, by sex, the proportional deaths, death rates per 100,000 like population and ratios of death rates of males to death rates of females, at certain periods of age, from diphtheria and from croup, according to the returns in Michigan during five quinquennial periods, 1870-94.

Five-year periods.	Causes of death as returned.	Sex.	Periods of age of decedents.				
			Under 5 years.	5 to 9	10 to 14	15 to 19	20 and over.
Per cent. of total deaths from each cause at known ages.							
1870-74	Croup	Males	88.1	10.9	.8		.3
		Females	86.8	11.9	.6	.3	.3
	Diphtheria	Males	56.4	28.3	7.6	2.6	5.0
		Females	49.8	33.5	10.9	2.7	3.1
1875-79	Croup	Males	83.5	13.9	1.9		.8
		Females	85.2	12.2	2.0		.6
	Diphtheria	Males	46.5	33.5	13.6	2.9	3.4
		Females	39.9	35.7	15.6	4.5	4.3
1880-84	Croup	Males	86.0	12.7	.7	.1	.5
		Females	82.3	16.2	1.4		
	Diphtheria	Males	46.3	33.2	14.1	3.9	2.5
		Females	41.0	35.6	15.4	5.3	2.7
1885-89	Croup	Males	85.5	12.9	1.1	.2	.2
		Females	85.4	12.9	1.1		.6
	Diphtheria	Males	47.8	32.4	11.3	5.2	3.3
		Females	44.9	33.7	12.7	4.6	4.0
1890-94	Croup	Males	86.1	12.4	.9	.4	.1
		Females	85.7	11.6	2.0	.6	.2
	Diphtheria	Males	43.0	35.3	13.8	4.5	3.4
		Females	41.1	34.5	14.4	4.2	5.7
Rates per 100,000 population of the same age and sex.							
1870-74	Croup	Males	79.2	10.7	.8		.1
		Females	65.1	9.9	.6	.3	.1
	Diphtheria	Males	53.9	30.3	8.5	3.4	1.2
		Females	52.4	39.1	23.5	3.8	.9
1875-79	Croup	Males	89.9	16.4	2.3		.2
		Females	62.6	9.8	1.7		.1
	Diphtheria	Males	156.4	123.6	83.3	13.0	2.6
		Females	150.9	146.1	69.2	21.8	4.1
1880-84	Croup	Males	126.8	19.8	1.3	.2	.2
		Females	96.2	20.0	2.0		
	Diphtheria	Males	287.4	218.6	101.1	30.8	3.3
		Females	278.8	255.3	121.4	44.7	4.5
1885-89	Croup	Males	123.6	19.1	1.7	.4	.1
		Females	112.6	17.2	1.8		.2
	Diphtheria	Males	188.0	130.4	49.6	24.6	2.6
		Females	183.6	139.3	57.7	22.1	3.7
1890-94	Croup	Males	91.2	13.7	1.1	.6	
		Females	76.0	10.5	3.0	.6	
	Diphtheria	Males	164.9	140.9	59.2	20.6	2.5
		Females	165.4	141.8	64.3	19.7	4.9
Per cent. of death rates of males to death rates of females.							
1870-74	Croup		121.7	110.1	133.3	.0	100.0
	Diphtheria		102.9	77.5	63.0	89.5	133.3
1875-79	Croup		143.6	167.3	135.3		200.0
	Diphtheria		103.6	84.4	77.0	59.6	63.4
1880-84	Croup		131.8	99.0	65.0		
	Diphtheria		103.1	85.6	83.3	68.9	73.3
1885-89	Croup		109.8	111.0	94.4		50.0
	Diphtheria		102.4	93.6	86.0	111.3	70.3
1890-94	Croup		120.0	130.5	55.0	100.0	
	Diphtheria		99.7	99.4	92.1	104.6	51.0

Relations of age and sex incidence of diphtheria and croup to their epidemic prevalence in Michigan.—Having considered separately the principal features of the changes in age incidence and sex incidence of diphtheria and of croup as manifested in the stastistics of successive quinquennial periods of years, it will be

GRAPHIC ANALYSIS OF MORTALITY IN MICHIGAN AS RETURNED FROM DIPHTHERIA AND FROM CROUP, BY QUINQUENNIAL PERIODS, 1870-94, WITH REFERENCE TO AGE AND SEX INCIDENCE.



NOTE.—Males are indicated by a continuous line, ————, and females by broken line, - - - - - - - -, in all cases. Ages are both inclusive: thus 0-4 represents the five-year group aged under 5; 0+ represents all ages, etc. Beginning at the lower part of the diagram (4), death rates at all ages per 100,000 population are shown for each cause of death. These rates are further analyzed by age-periods in the part above (3), and the relations indicated in this portion of the diagram are more clearly shown with reference to sex and periods of age in parts 1 and 2 respectively. In part 1 the basis of comparison is female mortality (death-rate) taken as 100 per cent.

of interest to see what relations these changes bear to the variations in the death rates. For this purpose the death rates from diphtheria and from croup at the most important periods of age, and from diphtheria, croup, and membranous croup at all ages, are represented in the diagram, by sex, and may be directly compared with the curves showing relative male mortality from each disease at specified age-periods, and with the curves showing the per cents of deaths at each period of age.

The death rates per 100,000 population according to the returns are, of course, too low in their absolute values for purposes of comparison with corresponding statistics of States or countries having accurate systems of registration; for this reason a supplementary scale making an estimated correction (addition) of 60 per cent. might properly have been added to the diagram on the hypothesis that the percentage of deficiency for these diseases, and for the several age periods included in them, is substantially the same as the estimated percentage of deficiency in the returns of deaths from all causes and at all ages. So far as the variations in mortality are concerned, ratios of the sexes, etc., the figures represented in the diagram are probably perfectly comparable among themselves, without correction. A constant error in statistic

data, affecting various elements uniformly, may be entirely disregarded for purposes of intrinsic comparison.

A characteristic feature of the curves representing the death rates from diphtheria is the high mortality for the period 1880-84. In the statement by single years (Table 2) it will be seen that the maximum year was 1881, the great epidemic year for diphtheria in Michigan, for which year the number of deaths registered from this cause (2,063) was greater than from any other cause of death, even consumption (1,954) being exceeded. The rise from the first period of registration, 1870-74, to the period 1875-79, and from the latter the period of maximum prevalence, 1880-84, was very rapid, being especially so for children at the age periods 0-4, 5-9. From 1880-84 the death rate as a whole declined, somewhat faster than it rose, to the next period, 1885-89, and continued nearly stationary from that to the present time. The ages 5-9 and 10-14 showed a somewhat more rapid decline from 1880-84 to 1885-89 than other ages, and have somewhat increased since 1885-89.

In marked contrast with diphtheria is the uniform and moderate course of croup. A slight amount of variation may, however, be noted, which is mostly in the same direction as the variations of diphtheria for the same time. Taking the age period 0-4 as especially characteristic, we see that croup increased very slightly from 1870-74 to 1875-79; somewhat more rapidly, but not at all approaching the virulence of diphtheria at this period, from 1875-79 to 1880-84; and, instead of rapidly declining like diphtheria, remained nearly stationary from 1880-84 to 1885-89. From 1885-89 to 1890-94 the death rate from croup has diminished.

The relative male mortality from croup appears to sustain a somewhat inverse relation to the general movement of the mortality from that disease. Taking the period 0-4 years of age as typical, the relative male mortality rose noticeably from 1870-74 to 1875-79 while the death rate increased in less degree; from 1875-79 to 1880-84 and 1885-89, the relative male mortality decreased while the death rate increased; from 1885-89 to 1890-94, the relative male mortality again rose while the death rate fell to about the same extent. Nothing very definite appears in regard to the proportional deaths from croup at this age, since the curves representing the ratios of male and female decedents move in opposite directions, and nearly neutralize each other.

The regular and nearly uniform rise of the relative male mortality of diphtheria at all ages, especially at the ages 5-9, 10-14, and the slight decline in the relative male mortality of decedents under 5 years of age, when compared with the very similar mortality curves at all of these ages would seem to indicate that sex has not been an appreciable factor in the epidemic history of the disease; that is to say, variations in the extension and fatality of diphtheria have not been attended with simultaneous special increase of mortality in one sex. The change in sex incidence seems to be a general one, advancing throughout the entire history of the disease, as included in the quarter century of statistics, in a determinate direction, and perhaps dependent upon some general social change or development in the treatment of male or female children.

Age incidence, unlike sex incidence, appears to sustain a certain relation to the degree of epidemic prevalence of diphtheria. This relation is direct for the age periods 5-9, 10-14, and inverse for the period 0-4. That is to say, when an increase in the general mortality from diphtheria and croup occurs, there is an increased percentage of deaths of children over 5 years of age and a decreased percentage of deaths of children under 5 years of age, as compared with the total mortality.

Dr. H. B. Baker, in a report to the Michigan State Board of Health on "The Present Comparative Immunity of Adults from Diphtheria," found that "when the reported deaths from diphtheria are over five-tenths of one death per thousand inhabitants, the average per cent. of diphtheria decedents over ten years of age is 22.55, and when the reported deaths from diphtheria are less than five-tenths of one death per thousand inhabitants, the average per cent. of diphtheria decedents over ten years of age is 19.27." This observation covered the statistics of Michigan during twenty-one years, 1868-88, for which period the mean per cent. of diphtheria decedents aged over ten years was 20.68.[9]

Mr. Arthur Shirley, President of the Epidemiological Society, makes the following statements in regard to the changes in age incidence in England and Wales:[10]

"There has been throughout England and Wales relating to the diphtheria mortality at all ages a considerably augmented incidence of the disease upon the population aged above 3 and under 10 years in the decennium 1871-80, compared with that in the decennium immediately preceding. And in the case of England and Wales as a whole, that increase has been maintained throughout the succeeding decennium 1881-90.

"When croup and diphtheria are taken together it is found that in both the periods 1871-80 and 1881-90 there was a relative increase of the disease at school ages (3 to 10) as compared with 1861-70."

Diphtheria declined in England and Wales from 1861-70 to 1871-80, and rose from 1871-80 to 1881-90. Between the two latter periods, therefore, the variation agrees with the tendency in Michigan, but the increased age incidence at older ages from 1861-70 to 1871-80, with a decreasing death rate, differs from the observation in this State. It is possible that the difference in the exact age periods taken may in part cause this decrepancy; and that it may be due, in part, to the increased proportion of children exposed at school in England under the Education act, which went into operation in 1870.

General conclusions.—It may be well to summarize the principal indications, statistic and otherwise, which may be drawn from the study of these statistics and which are clearly shown in the accompanying diagram. It is understood that such general conclusions have reference entirely to the history of the disease in Michigan, and are of wider application only so far as confirmed by the study of the statistics of other States and countries. As there are no other statistics, however, for any State west of New England embracing the time included in the Michigan statistics, together with statements of ages of decedents from individual causes of deaths, the results presented

[9] Rep. Mich. State Board of Health, 1891, p. xx.

[10] Quoted by Edward Seaton, M.D., in a "Report on the Present State of Knowledge Respecting the Etiology and Prevention of Diphtheria," presented on behalf of the English Committee at the Eighth International Congress of Hygiene and Demography, Budapest, 1894. British Medical Journal, Sept. 15, 1894.

in the Michigan Registration Reports will ever remain the only exact history of the course of diphtheria over any State area in the Western part of the United States during the onset and most fatal period of prevalence of the great epidemic, and as such are deserving of special study.

1. Statistically, the line of demarcation between diphtheria and croup is clearly defined. Their age incidence, their sex incidence, and, I might add, although the subject has not been studied in the present paper, their monthly and seasonal prevalence are distinct. This statistic difference is the expression of an equally well-marked clinical distinction. Even though bacteriology should decide with more certain voice than at present, that diphtheria and (nearly all) croup are identical, would it not still be advisable to keep separate the statistics of such a definitely distinguished portion of the diphtheria returns as are the deaths from "croup?" And if not the mere presence, but the predominance, of the Klebs-Löffler bacillus shall come in future to be the distinguishing characteristic of true diphtheria, statisticians may awake to the fact that a great mistake has been comitted in confusing the statistics of two diseases.

2. If the statistic distinction between diphtheria and croup be maintained, the return of "membranous croup," providing it be not given a separate place as in the Michigan reports, belongs rather to croup than to diphtheria.

3. The fact that the death rates are higher for males under 5 years of age from diphtheria, and that after that age the mortality of females from this disease is greater, is of interest, and accords with English observation. From this change in the relative mortalities, it would seem possible to derive therapeutic or prophylactic suggestions of value. What is there in the conditions attending the development of girls after the fifth year that is more favorable to fatality from diphtheria? They start out with a relative immunity, the death rate of female children under 5 years being markedly lower than that of male children at that age. Why does not this relation persist, and what causes the disease to bear more heavily upon girls than boys at the usual school age?

This question is discussed by Dr. T. W. Thompson in the article on "The Natural History of Infectious Diseases," *Stevenson and Murphy's Hygiene*, vol. ii. p. 298, but the reasons given are not intended to be considered conclusive. As embodying further the opinions of Dr. Downes and Dr. Thorne Thorne, I present his remarks in full:

"The excess of female mortality, at certain ages, at least, is no doubt largely due to greater exposure to infection—that is, to the closer and more continuous contact with the sick to which females are exposed as compared with males; but Dr. Arthur Downes has pointed to the very early ages at which the excess of female mortality is discernible as perhaps indicating that some further explanation is required. As regards this, Dr. Thorne remarks that 'the excess of diphtheria death which attaches to females over males from 3 to 15 years of age, increases precisely as the age advances which fits them more and more to take some share in the care of home, and of relations during the periods of sickness.' And he further remarks that 'something may depend upon the full significance of the term 'domesticity,' and upon its taking account of those acts of affection and tenderness which, in their relation to the sick characterize females during the period of girlhood, as well as in mature womanhood.' Both these considerations are deserving of considerable weight, especially as regards a disease such as diphtheria, in the dissemination of which close contact is known to play a conspicuous part; but it still appears to remain doubtful whether increased exposure to infection can be regarded as entirely accounting for the excess of female mortality, especially in the very early years of life."

It is probable that the greater docility, affectionateness and domesticity of girls render their share of the mortality from diphtheria greater than that of boys. A larger proportion of girls may be found in regular school attendance, owing to less temptation to truancy and less liability to employment during school age. Among children girls tend, as a rule, to come into more intimate personal contact with one another. Boys naturally isolate themselves after an early age, and repulse kisses, embraces and other demonstrations of affection, as unbecoming the manly character. Besides boys indulge much more persistently in outdoor sports and occupations, and thus "toughen" themselves to resist the initial lesions of the mucous membranes, resulting, perhaps, from atmospheric irritation, which often afford a point of entrance for the diphtheria germ. Speaking of croup, but with equal application to diphtheria, Hirsch remarks:[9]

"Something wrong in the upbringing of the family, particularly in the way of too much tenderness and coddling, has been the real cause of the family liability. The susceptibility which predisposes to this disease would seem to be bred in those children who are kept most from the effects of the weather, sheltered from every wind, and during the cold season anxiously detained whole days and even weeks indoors, and that too, in heated and not always well-ventilated nurseries."

Whatever the cause of the greater relative female mortality from diphtheria above the age of five years, it is a cause that has been undergoing progressive amelioration during nearly the whole history of the disease in Michigan. Should the change continue at approximately the same rate, the relative death rates of the sexes will become nearly the same after the lapse of a few years. Does this indicate that the "new woman" of the future is already foreshadowed in a more masculine type of education for girlhood? At least, then, one favorable result will have to be placed to the credit of the female renaissance, if it tends to prevent diphtheria.

4. The increased proportion of mortality at ages over five years coincident with a general increased prevalence of diphtheria, has already been sufficiently pointed out. Facts of this class have an important bearing upon our knowledge of immunity, and the self-limitation of infectious diseases, but the limits of the present paper preclude any special reference to this subject.

5. Incidentally the importance of stating death rates from diphtheria and from croup in the terms of the susceptible population has been suggested. It is only in this way that the real prevalence of these diseases in countries or States with various age-distributions of population can be accurately compared. For diphtheria the number of inhabitants under 15 years of age, or if this basis were not generally obtainable,

[9] Handbook of Geographical and Historical Pathology, iii, 65.

the number under the age of 21 years, would give fairly accurate results; for croup, the rates should be based on the population under five years of age. In the same way that the standard distribution of ages suggested by Körösi has been adopted by the International Statistical Institute for the computation of mortality indices, instead of the unreliable death rates, for international comparisons, so should certain standard ages be selected as bases for stating all mortality rates of children's diseases; and whenever a higher mortality is shown to belong to either sex, the standard population should be stated by sex.

6. Lastly, if this paper has any predominant purpose, it is to emphasize the necessity of statistic study of diseases, and to maintain that clear-cut statistic distinctions are equally cogent with clinical or bacteriologic arguments in determining nosologic classifications. Statistics may be likened to the brake that serves to restrain the plunges of the wild horses of medical theorizing, and prevent their dragging the car of true medical science through devious ways, and to final wreck amidst a chaos of unsupported opinions. It may not be the noblest office, but it is a necessary one; and a knowledge of statistic technique should be regarded as a fundamental part of the equipment of the medical reasoner just as fully as equipment in chemic, bacteriologic, pathologic and clinical methods is deemed essential at present. Vital statistics is historically and practically the basis of an enlightened sanitary science. The statistic pictures are to be considered, in their place, equally with the clinical pictures in making up our concepts of diseases; yet from the paucity of data, especially in this country, this is very seldom done. There are very few medical colleges in the United States that give any systematic instruction in the treatment of medical statistics. The hope for the improvement of this condition lies in the spreading of a higher opinion of the services of the medical statistician among the ranks of the profession at large, and through the profession to the people. As a result of such enlightenment, accurate systems of registration will gradually come into existence in this country in all of the states whose density of population and advanced civilization may warrant them; medical schools will adequately treat the subject in their curricula, and health officers, graduated therefrom, will be able to make intelligent practical use of registration data in limiting and preventing the spread of disease; finally a vast body of the most essential facts concerning the constitution and destiny of our people will be accumulated, whose full import, vast, social significance, and practical beneficence can not be estimated in advance, but, judging from the triumphs of sanitary science based upon an exact knowledge of vital statistics in the past, will prove a potent factor in the elevation of the human race.

PREVENTIVE MEDICINE IN APOPLEXY.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5-8, 1896.

BY EPHRAIM CUTTER, LL.D., M.D.
HARVARD, 1856; UNIVERSITY OF PENNSYLVANIA, 1857.
NEW YORK.

Presuming that the Section I have the honor to address is a board of medical police whose business it is to detect the pre-stages of diseases and to procure their prevention, if not their birth, the subject is then legitimately up for thought and has an ever-present living importance. The press rarely appears without some reference to apoplexy. To-day it is Baron de Hirsch's death cabled across the Atlantic in thousands of words and eagerly read by the public who love and appreciate such wealthy nature's noblemen. The press also, with the confidence conferred by its position, affirms that champagne freely drank caused his apoplexy within a few hours. But it must have had pre-stages longer than these few hours. This idea was expressed by the late Dr. F. A. Sawyer, Vice-President Massachusetts Medical Society, who told his son that his death would be from apoplexy, as it was. My cousin, the late Dr. Calvin Cutter, author of Cutter's Physiologies, after he had experienced apoplexy accurately predicted to his son. Dr. J. Clarence Cutter, the two succeeding "strokes" he should sustain and that he would die from the third and last, which he did. If I am correctly informed, Prof. Joseph Jones, M.D., LL.D., late member of our ASSOCIATION, and one of the brightest medical lights of the South, if not of the age, died from apoplexy. So also died Job S. Crane of New Jersey, another A. M. A. member whose character was like pure gold, and whose presence in our meetings has added the charms of delightful friendship and genial personality in the past. If they do these things in a green tree what shall be done in the dry? If such medical men are destroyed what will be done with the laity? The high esteem of these distinguished gentlemen impels me to tell what I know personally about their disease as a grateful tribute to the lovableness and glory of their characters.

What is Apoplexy Clinically and Conventionally?—It means "sudden loss or diminution of sensation and power of voluntary motion, usually resulting from inter-cranial hemorrhage." Simple or nervous apoplexy is where no lesion is discovered. Reference is here confined to apoplexy from clot or serum pressure on or in the cerebral substance or ventricles. The chief agency lies in the rupture of an artery, usually the basilar. No rupture, no apoplexy. A normal artery will not rupture with ordinary or extraordinary heart pressure. It must be weakened beforehand. Or, in other words, there is a *weakening of the artery before it ruptures.*

This weakening is not due to violence of puncture by a weapon; we are not considering traumatic cases. For years it has been taught and it has been found true that this weakening comes from a substitution of the circular muscular fibers of the arteries and of the fibrous coats of capillaries, sometimes by fats or fat acids, as oil, cholesterin, lardacein, stearin and margerin, with gravelly matters as atheroma, etc. The fats have not the tensile strength of muscular and fibrous tissues and hence the damage comes the moment the artery is not strong enough to resist the arterial pressure, normal or abnormal. Indeed, the artery becomes fragile like a worn-out rubber hose, which gives out where the interstitial molecular changes of the mechanical mixture of rubber and sulphur are most rapid.

The Clinical Lesion is the Fatty Degeneration.—The results of the clot pressure vary from instant death to protracted paralysis more or less complete as the site of hemorrhage is nearer to or more remote from vital nerve centers. *Hemorrhagic apoplexy, then, is merely a masquerade and local* manifestation of fatty degeneration in the cerebral arteries and

this is the line on which our medical police have to work.

Clues Macroscopic, i. e., with Unaided Observation.—1, 50 years of age and over, though apoplexy sometimes comes in younger persons from severe sickness or bodily abuse by food, drink and otherwise; 2, arcus senilis; 3, cataract; 4, amaurosis; 5, apoplexy of retina; 6, obesity, though strictly speaking it is not a fatty degeneration; it is an abnormal accumulation in normal localities; 7, waxy and lardaceous countenance; 8, edema or thickening of eyelids; 9, hebetude; 10, neuralgia sometimes; tic douloureux; 11, muscular weakness; 12, flabbiness of tissues; 13, atheromatous radial and temporal arteries; 14, senile gangrene; 15, defective vision; 16, the urine shows albumin; often necessary to examine seven specimens from voidings of seven successive days; 17, glaucoma.

Clues Microscopic.—1, casts of kidney, tubes; 2, fatty epithelia; 3, amyloid bodies in blood and urine; 4, free oil in blood and urine; 5, pigments blue, bronze, anilin blue, emerald green in urine and blood. 6, fat globules in leucocytes; 7, cholesterin in blood (credit should be given Dr. Jas. H. Salisbury for first noting 3, 4, 6 and 7 in his writings); 8, protoplasmic, filamentous or Indian club catarrh, one or all alternating with albumin, casts and fatty epithelia. This catarrh is very common in neurasthenia and should not be overlooked. A recent case under my son's care had been diagnosticated gout because of painful shoulder by another physician. Use on urine work for above clues, first, a good inch objective. All clues are not present in every case.

Causes General.—1, impeded or retarded languid functions; 2, fat food in excess; 3, carbohydrate foods in excess, producing paralyzing gasses by fermentation in alimentary canal; 4, want of exercise; 5, old age; 6, disuse of organs; 7, lack of motions and emotions; 8, abnormal metabolism or transformation (Dunglison); 9, loss of vital force or dynamos by work or pleasure, etc.

The general prophylactic treatment is to stop causes, restore normal metabolism, fully sustain nature and then she will *restore healthy in place of fattily degenerated tissues.*

Particular Treatment.—1, restore languid, impeded or retarded function by removing all mechanical, physiologic, chemic or pathologic restraints; 2, avoid fat foods; 3, avoid carbohydrates including alcohol entirely till signs are gone, and thus stop the gases which paralyze parts near and remote, thereby impeding the functions of life. Dr. Joseph Jones, in 1856, reported through the Smithsonian Institute that carnivorous turtles fed on parsley had fatty degeneration. Sir B. W. Richardson of London and S. Weir Mitchell of Philadelphia produced cataracts in ten minutes by injecting under the skin of a guinea pig or a frog 1 dram of a saturated watery solution of sugar. 4, exercise in some labor that has the psychologic stimulus of doing good to others; work is healthy. 5, avoid premature old age. Obliteration of the caliber of arteries, more or less complete, by peripheral deposits usually of a calcareous, atheromatous character, blocks in the aged the circulation of blood, osmosis, secretion, etc. But there is no reason for having old age come prematurely and people should live longer than they do now. In olden times there were some 900 years old, showing what the human race is capable of! 6, organs should be used as far as possible consistent with common sense. Unused horses, overfed, fattily degenerate in muscles. 7, when the list of motions and emotions that the limited knowledge of the writer can trace in normal human life reaches forty-three in number, it is plain that life is made up of motions and that it is important these motions should be normal. If they are languid one indication is to quicken them by forms of motion biologically penetrating. Music is one such form of harmonious motion now proved by Dogiel of Kazan, Russia, to dilate the capillaries, increase the flow of blood, remove congestions, calm the nervous system revive memory, promote excretion of carbonic acid from the lungs, promote digestion and confer vital force. Hence music means much good to those predisposed to apoplexy and should be had by them either as listeners or performers. The Hon. J. G. Blaine, in his final fatty ills, is said to have allowed hand-organ music under his windows. The late Czar of Russia, it is said, in his last illness had the trombone played at midnight. There was good reason for this. Electricity (specially the *galvanic*, as Althaus says that the *induced will of itself produce fatty degeneration of the muscles*) is an effective form of motion, biologically penetrating. Hence the favorable use of galvanism in fibroids—the writer has seen cases standing cured for twenty-one years. Fibroids, probably, are caused by impeded or hindered functions as fatty ills are. On this principle galvanic electricity is useful in the pre-apoplectic. Trolley car rides do good also, by the induced electricity.

8. Normal *transformation* or the laying down and taking up of tissues all the time going on—or *metabolism*, if the Greek word is preferred, is aided greatly by drinking distilled hot water one hour before meals and on going to bed. It may be taken cold, not iced, as there is no easier way of retarding or impeding functions than by a temperature below 32 degrees F. One argument is, as there must be from 100,000 miles or more of capillaries in an average human adult, it follows that in normal conditions there must be considerable force expended to maintain the blood circulation and all the functions dependent upon normal circulations. Now, if this capillary circulation is impeded by lack of water in the system (which is too generally the case) the way to relieve it is to supply more water. Spring waters heavily charged with salts are interdicted. They produce evil by blocking. *Again*, the drinking of hot water washes out the stomach of slime and yeast, promotes peristalsis, carries off undigested and unfermented foods and thus removes the gases which are causes of apoplexy. In this clinical light, flatulence, which is tabooed by society ethics everywhere, is a means of relief. Pre-apoplectics would, there is evidence to believe, prolong their lives by allowing flatulence to have free evacuations. Hot water and sometimes cold wonderfully promotes beneficial flatulence by causing the unstriped muscular fibers to contract. The proper treatment to stop flatulence is by cutting off foods that ferment. Hot water also washes out the liver, kidneys, skin, keeping the primæ viæ clear of gas, wonderfully quickening retarded and impeded functions and promoting normal metabolism.

9. Loss of dynamos by work, worry or pleasure. Life is very much a question of expenditure of vital force. It takes a certain amount to "run," so to speak, the body systemic and the reserve should be used for work, worry or pleasure. If one has no reserve he is like Sam Small's steamboat that every time it blew its

whistle it stopped! Of course this is overdrawn, as stopping the body means death, immediate; but many pre-apoplectics are using so much steam to blow their whistle in work, worry or pleasure, there is not steam enough left to run the body healthily; hence a retardation and impeding of function, and hence follow fatty ills we are considering. Allow an illustration. A woman of 65 years with an enlarged and fatty heart showed signs of pre-apoplexy. Under treatment on these principles the signs had nearly disappeared on a certain visit. The next day the free oil in the blood and the fat in the white corpuscles were greatly increased. The cause lay in a sudden removal from one room to another in her boarding house, the patient being mentally worried and tired out by the discharge of womanly duties which she would not entrust to others. On resting these signs soon diminished but did not entirely disappear. Rest is a remedy approved by all practitioners of medicine, and cures are due to rest that sometimes are credited to schools of medicine and medicinal measures. Other ways of treating loss of force are by plenty of fresh air (air is food) by a diet for pre-apoplexy of two-thirds animal to one-third vegetable food, or better by beef, mutton, lamb, whites of eggs, all suitably cooked, not raw, for animal food; wheat, rye, potatoes, sage, hominy, tapioca (celery as a relish), choosing not all but few of these foods at a meal, and watching their digestion and assimilation by the condition of the blood, feces and urine, not depending upon the patient's feelings or opinions. Force is also to be conferred in massage or the imposition of hands. The masseur must not be tired; I have known such to deplete patients of strength given them by resting and food. Massage is an old measure dating, it is said, 2,600 B. C. The blind have been masseurs from time immemorial in Japan. Force can be conferred by contact with horses riding, driving and handling. Force may be conferred by the stimulus of ideas, of well-deserved praise, by trust in God, by calmness, moderation and temperance, by not pulling oneself up by the roots daily to observe progress, by crushing out all envy, malice, hatred, by following out the golden rule; force may then be saved by not wasting what one has. These are little things. David Copperfield said when his wife was dying, "Life is the sum of little things." The successful prevention of pre-apoplexy means the intelligent study of little things, and nothing that touches the patient is too small; these are the days when the medical heavens are illuminated (?) by the lights of pathologic experts, that is, dead men's doctors. Would it not be just as well to practice medicine for the living? Text books of medicine are silent on this great subject of pre-apoplexy.

The result to be expected is that nature will restore to health the diseased cerebral arteries; space does not permit the adding of the clinical evidence of cases on which this communication is based.

A NEW TREATMENT OF PHTHISIS.

Read in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association, at Atlanta, Ga., May 5-8, 1896.

BY HUBBARD WINSLOW MITCHELL, M.D.

NEW YORK.

Pulmonary phthisis or pulmonary tuberculosis is perhaps one of the most widespread diseases to which mankind is subject. It occurs in persons of all ages and in every country, and in all conditions of life.

While tuberculosis occurs in nearly every organ of the body, the scope of this paper is confined to that form of the disease which attacks the lungs, and that form also which is known as acute tuberculosis.

Cause.—The cause of phthisis pulmonalis is due to the introduction into the lungs of the microörganism known as the tubercle bacillus. The existence of this bacillus was suspected by many, but it was left for Koch to demonstrate its existence, and its invariable association with this special disease.

The tubercle bacillus is a short, fine rod, slightly bent or curved, and hence the name often applied to it of the "bent rod." Its average length is from one-half to one diameter of a red blood globule. When stained with carbolic fuchsin it assumes a bright red color and presents under the microscope a well-defined body which contains from two to five vacuoles. These vacuoles give it a sort of beaded appearance, and some observer has attributed this appearance to the presence of spores, but it is probable that these vacuoles are the nuclei of new bacilli which are formed by the fission and subdivision of the parent bacillus. It is undoubtedly the case that these bacilli multiply by a rapid subdivision of themselves.

When the bacillus is treated with anilin dye or carbolic fuchsin it stains slowly of a bright red color, and retains this color permanently after treatment with acids, and this characterizes it from all other known forms of bacteria, with possibly the exception of the bacillus of leprosy. It can be cultivated in blood serum and on the potato, most readily in the former, and the cultures must be kept at blood heat. They grow slowly and appear about the end of the second week. The colonies of bacilli form thin grayish-white masses on the surface of the culture medium, and but little is known yet of the chemic composition of the tubercle bacillus. They are found in all tubercular lesions throughout the body, and in every organ where tuberculous disease is present, but, as above stated, they will be studied solely in connection with pulmonary tuberculosis.

The bacilli multiply with great rapidity in lung tissue, and a patient suffering with pulmonary consumption discharges them in the sputum in considerable numbers. When they are so expectorated, if great care is not taken to destroy their virulence, they become a focus of danger to others wherever they are discharged, and this shows the great danger associated with the sputum of phthisis unless it is most carefully disposed of.

In the dust collected from the walls and bedsteads of hospital wards, in asylums and prisons, bacilli have been found, sometimes in great numbers, showing that in these places the sputum was carelessly distributed and new foci of infection were thus formed.

The tubercle bacillus is thus a widespread and dangerous organism in all places frequented by patients suffering from phthisis.

Mode of infection.—It is not altogether satisfactory to say that phthisis is hereditary. Life insurance companies reject applicants for insurance whose parents or brothers or sisters have died of phthisis, even when the applicant himself was in perfect health. How far the theory of heredity is true is a disputed question, but from my own observation and studies, I believe that the ancestors of such persons did not confer a taint sufficient to warrant his rejection.

If a woman suffering with phthisis becomes preg-

nant it is not true, certainly in many cases, that she confers a phthisical taint upon her child, and the same may be said of a man suffering with phthisis, the woman whom he impregnates can not, through the venereal act, contract the disease, so that heredity is of less value to-day, in the line of modern researches, than it formerly was.

Contagiousness of phthisis.—If we accept the theory that phthisis pulmonalis depends for its existence upon the introduction into the lung of the tubercle bacillus, then that microbe must be introduced from without, and from some source where the bacillus has retained its activity and virulence, and when we remember that the sputum from phthisis patients contains vast numbers of these bacilli, which are distributed widely through dust and carelessness with which the sputum is voided, it will be seen that the danger from contagion is very evident, and the acquirement of this disease by contagion directly from a patient, or indirectly through his dried sputum which is inhaled elsewhere, forms the most common source from which this disease is acquired.

It has been very justly remarked by many observers that it is important to draw a line always between hereditary and accidental tuberculosis, for cases present themselves to the practitioner that have a very incomplete history, although by careful examination a conclusion can be reached upon which we can base our opinion as to its source.

Cases have been noted where phthisis has been acquired through inoculation, as from persons washing the clothes of phthisis patients, or the bite of a tuberculous person, or inoculation from a cut or abrasion where the sputum has been brought in contact with this traumatism. The expired air from the lungs of a tuberculous patient does not convey the disease, and a person coming in close contact with the patient will not necessarily acquire the disease from his breath, but kissing a tuberculous patient will undoubtedly produce the disease in some cases.

Infection by milk, by meat, and by water and food need not be touched upon here. The danger from these sources exists and must not be lost sight of, but space prevents my speaking of them in detail.

Influence of age.—Tuberculosis occurs at all periods of life. It is met with in the nursing infant, as well as in those tottering upon the edge of the grave. No age is immune from the disease. In the young we find the lymphatic glands very frequently affected, while in the old, the lungs seem to be especially prone to the disease.

In my judgment, *soil and locality* play an unimportant part, and the association of other diseases is to me of less importance than has been ascribed to them.

It is interesting to note the changes produced in the pulmonary tissue from the introduction of the tubercle bacillus. When a bacillus enters the tissue of the lung, it is believed to cause in the first place a proliferation of epithelioid and giant cells, followed by an inflammatory reaction and the formation of masses which are termed tubercle, and when these tubercle masses are once formed they quickly undergo caseation. This caseation, which is undoubtedly caused by the bacillus, is a process of coagulation going on in the cells, which lose their outline, become irregular, and are finally converted into a structureless substance. The tubercle may gradually be converted into a yellowish-gray pus in which the bacilli are abundant, and when this matter infiltrates the inflamed lung tissue it is loosened more or less by inspired air, escapes into the smaller bronchi, and finally is coughed up by the patient in the form of a thick yellowish or grayish sputum containing the bacilli in greater or less numbers.

When the bacilli are introduced into the lungs two processes may go on, the first, caseation and ulceration which is destructive and dangerous, the other, sclerosis, which is conservative and healing, and the ultimate result in a given case depends upon the capabilities of the body to restore the tissues, and limit the growth of the bacillus, or to permit the process to go on to a dangerous and finally fatal termination.

There are some cases where the bacilli are introduced into the pulmonary tissue and are for some reason destroyed at once, and in these we say sclerosis has taken place. The bacilli have gained a lodgment and have done some damage, but finally the victory is with the conservative forces of the body. In other cases the bacilli grow luxuriantly, caseation and softening occur, and victory is with the invading bacilli and a fatal result follows.

Symptoms of pulmonary phthisis.—After the bacillus has invaded the lung tissue, the symptoms are very soon manifest. The patient develops a cough which at first seems to be of a broncho-pneumonic type, and is marked with expectoration of a mucopurulent character. Dyspnea is a striking feature and is more or less severe. The respiration rises from twenty to fifty per minute and there is frequently cyanosis of the lips and finger-tips. The early physical signs are those of bronchitis.

Percussion teaches us but little in the early stages. On the contrary, auscultation is of the utmost importance. Râles are nearly always heard, either sibilant or sonorous, or they may be crepitant. We may, rarely, have crepitation from the presence of tubercle on the pleura. As the disease advances the râles become larger and more mucous in character, and we have a fine or coarse bubbling râle according to the intensity and extent of the disease. As the disease advances cavities may form in the lung tissue.

When the disease is confined to one lung the physical signs just described are present more or less, and the opposite lung is very frequently congested, and auscultation on that side reveals a harsh, rasping respiration.

The temperature rises sometimes as high as 103 degrees and is always a symptom of severity. The pulse is rapid and feeble in proportion to the extent and severity of the disease.

I will not touch upon the symptoms caused by the invasion of other organs by this disease. It is sufficient for this paper to deal only with the pulmonary type.

Duration of the disease.—Cases have been noted where the disease ran a rapid course and caused death in a few weeks. I have not myself met with cases terminating in so short a time. It is usually of a slower development and continues for a much longer period. In my own experience many months elapse before death takes place, and under the treatment which will be described later in this paper, no deaths have occurred up to this time, so that it is impossible to tell the exact duration of the disease. But without treatment of any kind the disease will terminate fatally in from four to twelve months.

Diagnosis.—The diagnosis of pulmonary phthisis is not difficult. The presence of cough, emaciation, night sweats, diarrhea, anorexia, thirst and general anemia, are nearly always present and point to the nature of the difficulty. But the unfailing test in the diagnosis is the presence of the bacillus in the sputum. As it is believed that this microörganism is the direct cause of phthisis, its presence is proof positive that the disease is pulmonary tuberculosis. If the sputum contains no bacilli, then the disease is not pulmonary tuberculosis *per se*.

It is not necessary here to touch upon the morbid anatomy of the disease, nor of the many lesser symptoms which are present in any given case, nor is it necessary to divide the disease into clinical groups, as some writers have done. This paper deals with pulmonary phthisis induced by the bacilli reaching the lung through the bronchi, termed by some writers "inhalation tuberculosis," the ulcerative tuberculosis which we are now considering.

Prognosis.—The prognosis of pulmonary phthisis, when not modified by treatment, is extremely fatal. Various percentages of death are given, and while these percentages differ with many writers, and perhaps no accurate percentage can be given, it is true, as every practitioner will testify, that the death rate is extremely high.

The mode of death may be by asthenia, or gradual failing of strength. Here the end is usually peaceful and quiet, disturbed perhaps by cough, but rarely by pain, and consciousness often is retained until near the end. Or by asphyxia. This occurs in the acute cases which run a rapid course, but rarely in the chronic, even of great severity. Syncope is also a mode of death, but not common. It occurs when patients in a very advanced stage of the disease insist upon going about, and if organic cardiac disease be present, as it often is, then syncope may occur.

Hemorrhage also may be a mode of death in chronic phthisis, and is due to the erosion and rupture of a large blood vessel or of an aneurysm in a pulmonary cavity. Coma may occur, due to meningitis, but this I believe is rare.

The most common mode of death is by asthenia, where the vital powers slowly succumb to the onslaughts of the disease.

Treatment.—The treatment of pulmonary phthisis is the special point to which I desire to call attention.

About three years ago I began to experiment in my private laboratory with a group of chemic salts known as the halogen group, and I found that these salts, when combined in definite proportions, formed a fluid having remarkable antiseptic powers. To this group I subsequently added the hypochlorites of sodium and potassium, as will be seen in the formula below. The resultant fluid was a chemic combination of the above named salts, and for want of a better name has been called after me, namely, "Mitchell's Fluid." It is with some diffidence that I use this name, but no better one appears to be available, and I will in this paper term it "fluid."

I first used the "fluid" in a large number of cases of ulcerative and suppurative processes occurring upon the external surface of the body, and through the courtesy of Drs. Taylor, Sturgis, Phelps, McGuire, Burchard, and the very able house staff at Charity Hospital, in the wards of which I was allowed to experiment freely, I obtained satisfactory results in ulcers of a syphilitic, traumatic and varicose nature, and in many of the lesions of syphilis and chancroid, the sores were healed in a very short time.

I conducted these experiments through a period of two years, treating 375 cases. I also used the "fluid" extensively in my own private practice, but up to this point it had been used externally only.

It occurred to me that if the "fluid" acted so well upon the outside of the body, it might be that it would act well upon phthisis, which is an ulcerative process in the lung tissue due to the presence of the tubercle bacilli, if the "fluid" could be brought in contact with the lung tissue, and I reasoned thus:

As the gastric juice is of hydrochloric acid reaction, and this "fluid" being of the same reaction, I thought if it could be introduced into the stomach when that organ was perfectly empty, it might be carried by the blood into the lung and there modify the course of the disease, and perhaps destroy the bacillus. This reasoning was acted upon immediately and with flattering success.

My first case was that of a young man 21 years old, who had a cavity in his right lung. He had had hemorrhages weekly of considerable severity, and when I first saw him he raised blood at each effort of coughing. His sputum contained pus cells and the characteristic bacilli. He had night sweats, anorexia, loss of flesh, and began to show the signs of phthisis cachexia.

I gave him the "fluid" in 2 dram doses, always on an empty stomach, that is, half an hour before each meal, and at bed time. The "fluid" was given full strength; no other remedy was employed. His diet was ordered to be rich and nutritious. Treatment was begun on June 1, 1894. On the third day his night sweats ceased, he stopped spitting blood and immediately his cough began to lessen. The treatment was continued steadily, and on July 31 his sputum contained few bacilli and few pus cells, and his general symptoms were much improved. On October 1, auscultation showed the lung had healed, and the sputum was free from bacilli and pus cells. He was completely cured.

I immediately selected eight cases, all women and all having the typical symptoms of phthisis pulmonalis. The treatment was the same as in the first case, and in periods varying from four to seven months they all recovered.

At this time I have in my private practice 130 cases of true phthisis pulmonalis. In every case there are present all the characteristic symptoms. Forty of these are now practically well, and this opinion is based upon the fact that the sputum is entirely free from bacilli and pus cells. Thirty of the above 130 cases are absolutely hopeless. The destruction of the lung tissue is too extensive to be restored, yet severe as they are, all of the symptoms are considerably modified. The diarrhea which so often accompanies severe cases is quickly checked, the night sweats cease, and very soon the respiration becomes more normal, and a degree of comfort given which was not hoped for, and when death comes, it will come largely robbed of its terrors through an amelioration of these distressing symptoms.

The remaining sixty cases, while they are all severe, I have every reason to believe that most of them will ultimately recover.

Treatment in detail.—I give the "fluid" in from 2 to 3 dram doses, clear, four times daily, always upon an empty stomach. This is absolutely a *sine qua non*.

I use a glass to measure the fluid, not a metal spoon. In all cases whisky is given, 1 to 2 ounces at a dose, two to three times per day.

The cough is somewhat lessened by adding essence of peppermint to the whisky in the proportion of half a dram to each dose. The diet must be nutritious and liberal.

In every case of phthisis in my practice the sputum is examined once in ten days or two weeks. These examinations are made by Dr. John Hoch of this city. His method of examining the sputum is as follows:

He stains the fresh sputum with carbolic fuchsin and methylene blue; the former stains the bacilli of a bright red, while the pus cells and other ingredients of the sputum are stained blue by the methylene. The sputum thus stained is mounted on glass slides, and a permanent record made of each case and of each examination, so that they can be referred to at any time.

Dr. Hoch uses a one-twelfth inch objective oil immersion lens, which gives a diameter of 925 times. This high power makes it possible to count every bacillus in each specimen of sputum, so that errors are absolutely eliminated. As the treatment progresses these microscopic examinations are made at short intervals, and the diminution in the number of bacilli are accurately observed.

When a case of phthisis presents itself for treatment I make a complete and careful examination of the patient, keeping a permanent record of each case with the history of all symptoms noted, and this with the record of the sputum made by Dr. Hoch, places the treatment of phthisis upon a firm, careful and scientific basis. This, so far as I am aware, is the first attempt made in this country to treat the disease in this scientific and methodic manner, and the results obtained have shown that it is of the highest possible value.

In addition to the above I enjoin every patient to keep as quiet as possible, remaining in bed and in doors when necessary, and I rely upon rest as an important adjunct of the treatment.

In the severe cases, where the cough is incessant and distressing and the fever high, I often give a pill at night, containing 3 grains of sulphate of quinin and ½ grain of powdered opium, omitting it as soon as possible for fear of disturbing the stomach.

The composition of the "fluid" is as follows:

Sodic hypochlorite	7	grams.
Potassic hypochlorite	7	"
Magnesic chlorid	1.5	"
Calcic chlorid	2	"
Hydric chlorid	2	"
Chlorin	5	"
Potassic sulphate	1.5	"
Magnesic sulphate	.5	"
Aquæ	1,000	"

Sodic carbonate, potassic carbonate, equal parts added in sufficient quantity to bring the solution to the proper degree of acidity.

Hemorrhage into the Pons and Opium Poisoning.—A special interest is attached to the symptomatology of hemorrhage into the pons Varolii, because lesions here sometimes very closely simulate narcotic poisoning. The slowing of respiration, the pinpoint contraction of the pupils, the unconsciousness, all give to some cases of pons hemorrhage a similarity to opium poisoning, and mistakes in diagnosis have been made even by men of large experience.—Dr. Dana in *Post-Graduate*, July.

THE EXPERIENCE OF SEVERAL PHYSICIANS WITH SERO-THERAPY IN TUBERCULOSIS.

Read in the Section on Practice of Medicine, at the Forty-seventh Annual Meeting of the American Medical Association held at Atlanta, Ga., May 5-8, 1896.

BY PAUL PAQUIN, M.D.

ST. LOUIS, MO.

One year ago, I was honored by the courtesy of this ASSOCIATION when I presented the results of my humble laboratory and clinical work in the domain of sero-therapy, as applied to tuberculosis. I had had then only six months of experience in the application of immunized horse blood serum in man. Preceding work had been in animals. Notwithstanding the many decided improvements I then reported and the apparent recoveries, it was yet too early to arrive at a reliable conclusion as to the merits of this form of treatment and the remedy itself. Since then, I have enlisted the aid of many physicians throughout the country, and will take pleasure to-day in reporting, in part, the results of their work, and my own, in proper cases, as well as indicate the failures, unavoidable in many instances by any and all forms of treatment. Many of these physicians have been persistent even in desperate cases of their tests of anti-tubercle serum, and some have been rewarded with results unlooked for.

Although I shall have the pleasure to present another paper on this serum to this ASSOCIATION, *i.e.*, before the Section of Pharmacy and Therapeutics, a preface to this report, by way of explanation of certain disputed questions concerning the rationale and utility of serum in tuberculosis will not be amiss.

I am facing some who have failed in treating consumption with serum; physicians who have doubts as to its value in therapeutics except as may be due to inherent conditions dependent on the relative immunity of the horse against tuberculosis; doctors who doubt the qualifications of private laboratories and their delvers and of a general practitioner's ability, opportunities and time to investigate, experiment scientifically, safely and successfully.

Since presenting my report last year Maragliano, of Genoa, reported recoveries of consumption by the use of the serum of the ass, to the British Medical Society; Behring, Winternitch, Foa, Roux and others write on the efficiency of immunized serum produced by themselves, either on experiment animals or man. Their labors are in the line of my own, and possibly some of their work antedated mine, although my researches on tuberculosis and its general treatment, which led to the production of serum and its application in medicine in 1894, date back many years, when I was connected with the State University of Missouri. While these foreign scientists of world repute, used serum from various animals, particularly the ass, the horse blood serum was immunized first in this country by myself.

The anti-tubercle serum, like the anti-toxin for diphtheria, rests on the biologic laws governing the defensive forces of an organism to oppose the encroachment of microbes and their products on the tissues and blood. Tuberculous individuals sometimes recover without remedy. This is due to nature's own efforts, viz.: exalted phagocytosis, with all that this interesting physiologic phenomenon implies. A complex being, such as man or the horse, is a republic of small animated subjects, the cells, with distinctive individual properties and obligated to co-operative functions for the sustenance of the whole. The brain

and nerve cells constitute the governing power; the phagocytes constitute the soldiers of the country. Their arms consist of their individual annihilating power in a physical sense and the antitoxin elements they produce, capable (probably by a digestive or diastatic property) of neutralizing the poisons thrown amidst them by the armies of microbes constantly attacking the wonderful aggregations which they defend. What occurs in a case of consumption cured by nature occurs in a horse properly subjected to the influence of the consumption poison. Either a natural antidote is increased in power, or a new one created, and this is what exists in the serum I use in man. Man suffering from tuberculosis is under the influence of a certain amount of tuberculin, a poison, and nature produces in his system an antitoxin to counteract this nocive agent. But usually the army of invaders win the fight after a more or less prolonged and painful conflict. What the laboratory is expected to do is, to supply man with this defensive force, the antitoxin, produced at the expense of the horse's system rather than his own.

One must not be too sanguine. Little hope can be offered to the unfortunate who suffers from advanced tuberculosis, with extensive destruction of tissue; general tuberculous intoxication; general debility; pronounced dyspepsia, deficient assimilation and dissimilation, difficult and perverted secretions and excretions, and the hopelessness of such cases is emphasized, more or less, according to the more or less pronounced microbic complications which may exist. These complications are influenced only secondarily, by virtue of nature having recovered some strength after the bacilli of tuberculosis are arrested in their development and devastation. I have confidence that early cases of tuberculosis can nearly all be arrested by serum administered under proper conditions, and that were it the policy of the laity to submit to constant observations and repeated analysis the moment a lung or bronchial irritation manifests itself, the diagnosis of incipient phthisis would be made early enough to diminish the death rate due to consumption 90 per cent. by the action of serum.

While I would take pleasure in quoting from all the reports of more than sixty physicians, who have used the serum, more or less successfully, the time at my command will not permit it. Consequently, I will limit myself to cases that have not yet been reported, or reported in the past to a limited degree, and are now in a different or more improved condition.

I shall call attention first to a case of J. R. Lemen, M.D., St. Louis (reported in the *New York Medical Journal* for Sept. 21, 1895) in which the Doctor claims to have effected the recovery of an acute case of tuberculosis, in the person of R. C. G., a real estate agent; age 60. I am personally acquainted with the patient and saw him when he was prostrated in bed, weighing less than 160 pounds. The symptoms were clearly those of acute tuberculous pneumonia. The bacilli were present in profusion. He has now recovered and to-day attends to his business as usual and weighs 224 pounds.

Case under care of Geo. W. Cale, M.D., St. Louis, Mo.: B. McG., age 18 years, 2 months, has been suffering with joint and bone tuberculosis for seven years and had had ten operations performed on different parts of his body to open abscesses and to remove necrosed bones. The seat of the primary trouble was the right hip joint but it was giving him trouble in every limb. The left tibia was much involved, having at one time eight openings, discharging a tubercular pus. The hip had three openings that would heal and open alternately and one that was open continually for seven years. He had an abscess on each arm, one of the sternum, one of the index finger of the right hand, a tubercular nodule in the scrotum, an abscess near the apex of the left scapula and two on the lower jaw. The patient says that after the continued efforts of Dr. J., of Waverly, Ky., who had four consultants, Drs. H., of Henderson, Ky., and A. J., of Sturgis, Ky., had failed to cure the patient; it was decided to let nature take its course. He was without medical aid for two years. In the fall of 1894, he was put in charge of Dr. Broome, St. Louis, who performed an operation to remove necrosed bone from thigh and tibia, thinking that these openings would heal. This having failed, he decided to try the serum treatment and the case was taken in charge by Dr. Cale. He began the treatment in March, 1895, at which time he had four abscesses discharging a characteristic tuberculous pus and two others that afterward opened. He had daily injections of 20 to 30 ms., and at the close of six months treatment, five of these abscesses had healed, he had gained ten pounds and temperature was normal. He is working steadily and is still gaining in weight. The last and only opening, a very slight one, is in the thigh, and dead bone has been located which is the cause of it remaining open. Up to the present date he has gained sixteen pounds, and is enjoying good health.

Dr. L. L. Shropshire, of San Antonia, Texas, reports in the *New York Medical Journal*, of January, 1896, the case of a brakeman 25 years old, who had had hemorrhage of the left lung, followed by fever, purulent expectoration, loss of weight, and generally declining health. The physical examination had revealed dullness over upper lobe of the left lung, moist râles and a gurgling sound; violent cough; abnormal temperature reached as high as 103 F. Had had night sweats; could retain but little food, losing flesh rapidly, weighing at the time 125 pounds. Microscopic examination revealed bacilli of tuberculosis. After two or three weeks of daily injections of serum, night sweats grew less, appetite returned and digestion improved. Four months after the beginning of treatment he is practically well, and to-day, about seven months after the beginning of the treatment, he is reported as recovered and attending to his duties as a brakeman.

He reports another case, a shoemaker, age 51, who had contracted tuberculosis. The diagnosis was made from physical signs and microscopic analysis. He had declined in health and strength very rapidly, weighing at the time 131 pounds. At the time of the report, he had returned to work and had gained 18 pounds, and to-day he is reported as having recovered.

He reports two other cases with positive improvement and gain in flesh and mentions twenty-five cases, treated up to that time with improvement in all of them.

A. M. Hayden, M.D., Surgeon, St. Mary's Hospital, Evansville, Ind., reports cases as follows (In the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION):

My first case was one with large cavities in left lung, hepatization of the lower portion of right lung; had a great many hemorrhages; sputum contained large quantities of bacilli; weight 120 pounds. Treatment commenced May 10, 1895. In

three months tubercular bacilli disappeared from sputum entirely, and it has remained free from them ever since. The cavities in left lung healed up, with great contraction of the left chest, three or four inches. It has remained so. The patient ceased to expectorate heavy sputum, and now expectorates a light frothy sputum. Has had no hemorrhages since treatment began; he has weighed 140 pounds for the last six months; ridden a bicycle; eats well, and commences his duties as assessor to-morrow. After the first three months, I gave him one to two ounces only at intervals of one and two months. I am satisfied that he would have been dead long before this had he not had the serum.

Case 2.—A young man, 25 years old. Family history was that of tuberculosis. His sputum contained quantities of tubercular bacilli; weighed 110 pounds; had been west without benefit; had night sweats, fever and all symptoms of the dread disease. I commenced his treatment September 8, 1895. I gave him 56 daily injections of 35 ms. each. Tubercular bacilli disappeared from sputum; gained 10 pounds. January 20 I commenced and gave him 16 more injections, during which time he gained five pounds, which is more than he ever weighed in his life. He is still in splendid health and says he is feeling better than he ever did in his life. To-day I advised him to take another ounce of serum to guard against relapse.

Case 3.—A young man with long standing hip-joint disease. I gave him an ounce in January, 1896, during which time he gained sixteen pounds in flesh and general health much improved. He then stopped two weeks, during which time he ceased to gain flesh. He then commenced again and took one ounce more and gained ten pounds. His health has been much improved since.

Case 4.—A man aged 40 years. Several brothers had died of tuberculosis; was taken sick in November with a cough, night sweats and fever. His family physician treated him until January, 1896, when I was called. He was much emaciated, no appetite, night sweats, fever, etc. While he coughed almost incessantly, he did not expectorate. I failed to find any lesions of the lungs in physical examination. His liver failed to act (chalky evacuation, etc.) His family physician had treated him faithfully without results, and he was satisfied that patient was suffering with tuberculosis of liver and other glands. I advised him to use serum, stating to patient that if his trouble was tuberculosis he would be benefited, if not cured. He consented and started the treatment. The improvement commenced at once. In sixteen days he gained sufficient to get up and walk a square to a grocery and get weighed, and found that he weighed his usual weight, 150 pounds. We then stopped the treatment for ten days. Patient requested me to begin again, saying that his appetite was not so good and that he was having night sweats again. I ordered another ounce; had him weighed, and found he weighed 150 pounds still. I gave him one more ounce, which covered sixteen days, and again had him weighed, and found he weighed 170 pounds, a gain of twenty pounds in sixteen days. He is now at work and says the serum saved his life, and will not hear to anything else. After I commenced the treatment I stopped all other medication.

I have a case of laryngeal tuberculosis that has just finished her second ounce, of thirty-two days' treatment, and she has gained one pound; has a better color and says she feels much better; and Dr. Lehardy, a throat specialist, who has been examining her throat, says the ulcers on vocal cords are improved.

I have one lady patient with acute tuberculosis of lungs that has taken two ounces, thirty-two days' treatment; was benefited during the first two weeks, since which time she has lost, and at present her condition is not any better than when she commenced her treatment. However, she has a mixed infection.

I am also treating another lady that has pulmonary tuberculosis. She has taken 1½ ounces, twenty-four days' treatment. She is improving very rapidly, and I am satisfied that she will recover. All my cases have been diagnosed by presence of tubercular bacilli in the sputum, as well as by physical examination, except the one with tuberculosis of the liver. Diagnosis in that case was based on family history and physical signs, together with the fact that he went from bad to worse in spite of the best medical treatment.

Dr. J. A. Dunwoody, Cripple Creek, Colo., April 23, 1895, reports: I will begin first with my own case.

Case 1.—J. A. D., male, white, age 30. On July 26, 1895, upon physical examination, the upper two thirds of the left lung was found to be infiltrated; numerous moist râles could be heard throughout this portion. Expectoration of a mucopurulent character; about two ounces during the twenty-four hours. Weight 125 pounds. Microscopic examination showed tubercle bacilli. Range of temperature was from 99 to 100 degrees in afternoon, which continued until August 2, when I was attacked with acute pleurisy on the left side, which confined me to bed ten days. The temperature ranging then from 100 to 102.5 degrees for a week, after which time it fell to 99 to 100 degrees; until September 18, when it became 98.5 degrees. The injection of serum was begun July 26, 1895, with 10 m. and rapidly increased to 45 m.; then went back to 30 m., which was maintained continuously, notwithstanding the attack of pleurisy, until Dec. 24, 1895, at which time there was a small abscess produced, through want of proper care of the physician giving the injection. Weight at the time (December 24) had increased to 143 pounds; expectoration had ceased, not being able to collect enough for microscopical examination. Physical examination revealed the absence of all râles; clear vesicular respiration throughout the affected portion of the lung, though somewhat weak in character. Right lung not affected at all. March 24 was attacked with la grippe, during which time weight was reduced to 134 pounds, and cough returned for a short time, loss of appetite, etc. April 13, I resumed the daily injection of 30 ms. of serum with an increase in weight of two pounds, and cessation of cough. Have used no other treatment at all, the ingestion of serum alone. This point in my case proves conclusively the great mistake of stopping the serum before the lung tissue has been restored to its full strength and vitality.

Case 2.—H. H., white, female age 4. Weight 27 pounds. Date of examination Jan. 3, 1896. Left lung almost completely consolidated; no vesicular respiration, bronchophony quite distinct, cough quite distressing at times; range of temperature 99 to 100 degrees in the afternoon. Began the use of serum Jan. 3, 1896, with a dose of 4 ms. and rapidly increased to 12 ms. daily. Right lung no lesion. During the first six week; of sero-therapy patient increased in weight four and one-half pounds and has maintained this weight (31½ pounds) until the present time. Upon physical examination, April 8, find that there is some vesicular respiration throughout the affected lung; cough has almost entirely ceased. During the last three weeks the injections have been somewhat irregular as the little patient was in another city two miles distant from my office, having had a mild attack of scarlet fever.

Case 3.—Mr. S., white, male, age 46; weight 135 pounds. Date of examination March 16, 1896. Left lung almost completely consolidated; no vesicular respiration; quite dull and flat upon percussion; small tubercular ulcer upon the epiglottis and vocal chord, affecting the voice. Expectoration about four ounces daily. Patient states that he was first affected with tuberculosis in October, 1894. Daily injections of 30 m. were begun on date of examination. There was considerable erythemia in this case which gradually disappeared, though the serum was given daily. Examination, April 21, find that there has been wonderful improvement in the condition of the lungs. There is already some slight vesicular respiration throughout the lung. Expectoration has diminished about one-half. Has increased four pounds in weight. When this patient commenced the daily injections of serum, he could only walk a very short distance without extreme fatigue; now he can walk at least half a mile, without any discomfort at all.

Case 4.—J. B., male, white, age 21 years. Date of examination Feb. 15, 1896. Patient states that he has had tuberculosis since the spring of 1893. His normal weight was formerly 143 pounds. Left lung at time of examination was in the same condition as the preceeding case; no vesicular respiration; dull and flat upon percussion. Present weight 115 pounds; very much emaciated. Patient difficult to control and comes at irregular intervals for the injections. There is evidence that this patient practices the disgusting habit of masturbation. Upon examination April 21, can find little or no improvement and there is little hope of his ever being relieved.

Dr. A. D McIntyre, Union Grove, Wis., reports having used the serum, with very flattering results, in a case of ovarian tuberculosis, the history of which I failed to receive in time to embody in this paper, but which will be published.

Dr. William Miller, Boerne, Texas, reports a case of pulmonary tuberculosis in the second stage absolutely recovered. I had an opportunity to examine this case about a month ago and there existed then no physical signs of tuberculosis, nor in the expectoration by microscopic analysis. After several months of treatment, on March 19, 1896, Dr Miller reports as follows concerning this case: "Examination of Mr.

Malloy, at Boerne, Texas, March 19, 1896: Pulse, 72, full and strong; respiration 18; temperature 98½; weight 152 pounds. This gentleman has gained 20 pounds since he came under treatment. Chest measure: expiration, 35½; inspiration, 37¾. Respiratory murmur clear and distinct over both lungs; no cough or expectoration."

Dr. Miller claims "specific improvement in 40 per cent. of the cases treated; 30 per cent. received some benefit, and 20 per cent. did not improve." In his explanation of the failures he says: "Nearly all the cases I have treated were in the third stage, and 30 per cent. of these at the end of their rope."

Dr. Hoell Tyler, Mentone, Cal., himself a tuberculous patient, states that he took the serum for five months through the kindness of Dr. C. C. Browning, Highlands, Cal., and that he had on Jan. 2, 1896, no symptoms of the disease in his lungs, and to-day he is attending to his usual duties as a physician.

Dr. J. L. Wiggins, East St. Louis, Ill., had the following case in June, 1895:

Miss V. Z., East St. Louis, Ill.—Had been ill several months and prostrated in bed with a complete history of acute, pulmonary tuberculosis for some weeks. Temperature 103 to 104 degrees F. almost continually; microscopical analysis demonstrated the bacilli of tuberculosis. Three physicians consulted and diagnosed acute tuberculous pneumonia. Every ordinary method of treatment was pursued, and the fever remained at 104 F., even reached 105 F., with symptoms of delirium, etc. The lungs were both largely involved, consolidation nearly complete in one. Dispnea excessively pronounced, weakness extreme; prognosis fatal. Everything having failed, the serum which I produce was tried. The treatment began early in June, 1895. Doses ranged between 20 and 40 ms. daily, and were continued some six weeks more or less regularly. The result was that the temperature decreased gradually and steadily after the first seven days' treatment to normal temperature, which was reached on the 22 of June, or thirteen days after the first injection. Injections were continued until the end of July. The patient gradually gained strength and flesh and is again at work. She weighs 132 lbs; was emaciated to at least 80 lbs before treatment. The germs of tuberculosis have disappeared entirely and all previous symptoms of lung disease are absent. Case recovered. The diagnosis of this case, which seemed clear to all the physicians, was questioned by one man because recovery had occurred, and here is the reply of Dr. Wiggins: "In answer to your query, 'Did you consider the case of Miss V. Z. acute tuberculosis,' I will answer unqualifiedly, yes. At the time of treatment with serum I had no hopes that the case would recover, either with or without serum. But as the temperature began to fall, diarrhea, which was before uncontrollable by medication, was controlled without medication, and the cough and hemorrhage became lessened and gradually disappeared. I concluded that these marks of improvement were more than a mere coincidence. The diagnosis was clear, outside of microscopic analysis. This in the beginning was clouded. I would have filled out a death certificate, had she died, as being the result of tuberculosis."

Among my own cases I may report:

Mr. E. D., St. Louis, Mo., age 36 years; occupation, shipping clerk. History of glandular tuberculosis, dating back about eleven years. Had pneumonia four years previous to examination in my office, May 16, 1895; had been declining six months; had night sweats and fever; pain in left lung, back and front. Pulse at 108 degrees at the time of examination; abnormal temperature ranged from 99 3-5 to 101 degrees; cough chiefly in the morning; expectorated a yellowish matter. Bacilli present. Slept fairly well on the right side but could not sleep on the left; was too weak to attend to his duties properly. Dullness in the left lower lobe and crepitus of the left apex over a lateral area of four inches, extending about three inches downward; interrupted breathing both sides. All these symptoms disappeared in four months of treatment consisting of 15 to 30 ms. of serum a day. Several examinations of sputum made since revealed no bacilli. Mr. D. is at work from twelve to fifteen hours a day, Sundays included, and feels strong and in good health. He did not bear the injection of serum well, but he was persistent and recovered.

Mrs. H. R., St. Louis, Mo., consulted me in February, 1895. Had been ill for two years. Had had slight hemorrhages; was coughing very severely and expectorated a yellowish, mucopurulent material, occasionally tinged with blood. The sputum was full of bacilli of tuberculosis and largely loaded with different forms of pus germs. There was infiltration in the apex of the right lung between the third and fifth rib, covering an area of about four inches, laterally, and penetrating the lung more or less. There were mucous râles about the middle of this area, very pronounced, and interrupted breathing on both sides. The circulation was exceedingly rapid and the fever ranged from 99 to 101 degrees F.; it rarely went above that. Patient had lost much flesh, being reduced from 130 to 90 pounds. At the regular dose of 30 ms. three days for four months and then irregular treatment three or four times a week, and with a loss of three weeks at one time, the whole treatment covering a period of six months, Mrs. R. increased in weight to 132 pounds, and became strong accordingly; developed a splendid appetite, and for the last three months the sputum was exceedingly scarce and comes now only when she is affected by cold. It exhibits no bacilli of tuberculosis. She suffered a miscarriage and six weeks' illness recently, but her lungs remained apparently sound. The consumption symptoms which existed at the beginning have disappeared.

Mr. F. S., St. Louis, Mo., was examined in February, 1895. He weighed about 145 pouuds at the time. He had had very profuse hemorrhages at Hot Springs, and was sent home considered hopeless; had lost about fifty-five pounds from his regular weight which was above the normal for his size; coughed a great deal at night and day; expectorated a thick, yellowish matter loaded with the bacilli of tuberculosis and other microbes and was gradually losing ground. He was unable to perform his duties as a groceryman. Physical condition evidenced tuberculous affection in both lungs, particularly in the right, over the whole of which interrupted breathing was very marked. The lower half of the lung exhibited moist râles and softening. Symptoms after seven months of more or less regular treatment, which consisted of 20 ms. daily in the beginning, and was increased to 40, and once in a while to 60 ms., almost entirely disappeared, with the exception of a slight interrupted breathing. Flesh was regained to the amount of 170 pounds, and now strength is as good as ever. Mr. S. has been for four months without treatment, attending to his usual duties, working hard every day. He expresses the opinion that he is free from disease. The bacilli are now absent, but there is still a slight catarrhal condition of the bronchi, with micrococci. His condition of health is continually improving. Active tuberculosis, at least, has been arrested by the serum.

Mr. G. N. F., St. Louis, Mo., was examined April 29, 1895. Age, 45 years; occupation, bookbinder. Had had a dry, hacking cough two years; had had pneumonia at the age of 18, congestion of the lungs, so-called, two years previous to his examination. February 7, 1895, he had severe hemorrhages, and at the beginning of treatment he weighed 130 pounds. Expectoration thick and yellowish. Bacilli of tuberculosis numerous. Temperature increased at times; infiltration of the left apex below the second rib, about three inches downward and four inches across, evidenced both anteriorly and posteriorly, dullness over same region; crepitus over some of the area, and râles and crackling on deep inspiration extending below left breast, anteriorly. Mr. F. was treated with tubercle antitoxin from the beginning of May until October, almost every day, at the dose of 30 to 40 ms. Since then several examinations have been made and no germs of consumption are to be found. Physical symptoms have now disappeared and the patient is at his work, feeling strong and well and considers himself cured. He weighs 143 pounds, which is more than his normal weight before his illness.

Mr. F. B. M., St. Louis, Mo., age 20; occupation, railroad clerk working at night. He had bronchitis at the age of 14; had suffered from night emissions of early puberty; previous health feeble; cough slight; pain in the lower lobe of the left lung; temperature 99 to 100 F. Physical examination evidenced dullness of the lower left lobe, beginning at a line drawn below the nipple and extending toward the base. Microscopic examination revealed the bacilli of tuberculosis; not in large numbers. Mr. M. was treated from May 27, 1895, to the middle of September, practically four months. All physical symptoms and evidences of tuberculosis have disappeared. He is now at work as before in good health. No bacilli have been found in examinations made since September.

Miss G. A., St. Louis, Mo., age 19 years; occupation, music and vocal student; had influenza in Memphis six years before; dry cough for a year; weighed 123 pounds. Hemorrhages four years previous to examination Sept. 26, 1895, larynx infiltrated; temperature from 99.5 to 101; coughing much and expectora-

tion in the morning of a yellowish matter. Bacilli of tuberculosis quite numerous. Heart disease evidenced regurgitation. Treatment began the last day of September, 1895; injected very small doses on account of her heart condition, that is, 10 to 25 ms. daily. At this time Miss A. weighs 136 pounds; the bacilli of tuberculosis are now absent and for two months there has been but one or two in the field of bi-monthly examination. Cough has almost entirely disappeared. Strength has been regained and appetite is splendid, and the patient is considered as having almost, if not quite, recovered, as there exists no longer the physical signs of infiltration nor any signs of breaking down. There is still expectoration with micrococci.

Miss S., Nashville, Tenn., began treatment in May, 1895, and remained under its influence for some three months. She came with a written diagnosis of pulmonary tuberculosis from her family physician, which was substantiated by microscopic and physical examination. The bacilli of tuberculosis were found in large numbers and the patient was rapidly losing ground both in weight and strength; coughing considerably, particularly at night; expectorated occasionally a yellow greenish matter. Night sweats had existed and fever ranged at times from 99 to 102 F. She was treated with serum at doses ranging from 20 to 30 ms. daily. After three months she had gained ten pounds. She then removed to Las Vegas, N. M., where she resumed the treatment and her improvement continued. She had first lost flesh, but again increased in weight and every symptom seems to have disappeared, if I may judge from the reports sent me. Bacilli have not been present for two months.

Mrs. A. C., age 26 years, married, has had three children and two miscarriages, one recently. At the age of 14 she received a blow in the chest, at which point pain appeared frequently whenever the patient contracted cold. On examination infiltration was discovered, covering an area of about three inches in diameter, on the right side below the breast; also a dullness in the left lung between the second and third ribs, extending about two inches downward and two inches laterally. She had had various symptoms of tuberculosis for some years and dated the accidental incipiency of it fourteen years previously when she had received the injury mentioned. She has had several hemorrhages. The active development of the disease dated three years before my examination, which occurred June 7, 1895. At that time she weighed 115 pounds. To-day she weighs 135 pounds. She had dyspnea; expectorated a great deal; coughed very much and had a poor appetite. Now all these symptoms have disappeared and her strength has increasd so that she is able to perform her duties; comes to my office daily and expresses herself as improving continually. The physical signs above mentioned have disappeared almost completely. A few bacilli were found in the last three months.

Mr. V. (employed at our institution) a patient under the charge of Dr. Hanau W. Loeb, had laryngeal and pulmonary tuberculosis. His condition had been declared hopeless by a number of specialists in St. Louis. He has been treated under the special care of Dr. L. and myself, occasionally, for a period of about ten months, having received from 30 to 120 ms. daily. At the beginning of his treatment there existed infiltrations of the larynx and other lesions. He had lost his voice, weight and strength. He was in a hospital, unable to perform any work. He was, at the writing of this report, assisting in the care of some twenty-two horses, working many hours every day in water and dust. His appetite had improved and his strength good. He is susceptible to colds, but under the treatment with serum he had gained a condition which permits him to do all the menial labor that can be asked of any man. Rarely have we found the bacilli in the scant expectoration of the last four months. I report him because he was incidentally and indirectly under my supervision some months, and the injections were done by my assistants or myself. The case is surely under control at present. Some physicians pronounce him practically cured.

John H., aged 48. Pulmonary tuberculosis two years; prostrated in bed at city hospital; cavity, contracted lung, bacilli numerous; mother died of phthisis; cough aggravating. Injections 30 ms. daily, begun Dec. 1, 1894; continued for three months regularly. Weight increased 6½ pounds first two months. Has since been under treatment irregularly. Has been at work for over a year, grooming from twelve to twenty horses, ploughing and farming generally part of the time. Bacilli absent.

Miss Y., age 18; pulmonary tuberculosis, first stage. Lost ten pounds; infiltration in and dullness over area of three inches in diameter between second and sixth ribs, in right lung; cough persistent at night and expectoration profuse in morning; bacilli present. Miss Y. was treated over four months almost daily, at a dose of 30 ms. hypodermically. To-day she has more than gained her normal weight, is absolutely free from cough, and the last symptom of pulmonary tuberculosis has disappeared; bacilli absent.

Dr. S. B. Hall, Rock Island, Ill., reports as follows, April 28, 1896:

Case 1.—Age 27; has been coughing since January, 1895; normal weight, 160 pounds. Weight at commencement of treatment (Dec. 20, 1895) 132 pounds; present weight 136 pounds. Average dose 25 to 30 ms. Have had to suspend treatment several times. Coughs and raises very little at present; sleeps well; has a good appetite, has moist râles in upper lobe of left lung. Right lung normal. Have suspended treatment for a while. This was a charity case; lived in a poor damp house and had barely the necessaries of life. I think he has made a wonderful improvement.

Case 2.—Male, age 40; sick one year, given up by several doctors, is a carpenter by trade; was confined to bed three months prior to the beginning of treatment June 25, 1896; no cavities, but the upper lobe of the left lung and the middle lobe of the right lung were the most affected. Cough was incessant—coughed two-thirds of the night. Maximum dose 45 m. average 30 m. Cough is markedly diminished and he sleeps and eats fairly well. His greatest trouble now is a soreness in the trachea and bronchial tubes. He says they seem raw. Both of these patients refused any additional treatment and they have both improved wonderfully.

Dr. C. E. Bauer, St. Louis, Mo., writes on April 28, 1896:

Case 1.—Age 40 years; weight 140 pounds; height 5 feet 10 inches. I was called the latter part of October, 1895, while he had a hemorrhage. I was told that he had two hemorrhages before this last one, about three or four months apart. He coughed a great deal and expectorated a thick greenish sputum. On percussion I found a dullness of the left side extending from the supraclavicular space to three or four inches below clavicle. On auscultation, I could hear nothing but a blowing murmur; after coughing, moist râles. Very profuse perspiration at night. Temperature in the morning 99; in the evening 100 and 101. I commenced with injections of 10 ms. of serum and gradually increased to 50 ms. daily. After injecting about two months, I had to reduce the amount to 30 or 35 ms. on account of sudden rise in temperature. I have used the serum in this case from Nov. 2, 1895, until April 1. Since then I am only making two injections a week. The patient has increased in weight from 140 to 156 pounds. He coughs very little and there is not any sputum at present. The sputum before treatment showed a great number of tubercle bacilli and streptococci. Night sweats have ceased entirely. On auscultation, I hear a blowing murmur, but no moist râles. He has returned to his occupation as fruit peddler.

Case 2.—Miss L., age 22 years; height 5 feet, 4 inches; weight 110 pounds before treatment. Had a cough for some months and was losing flesh, expectorating a great deal; respiration increased to about 35; temperature in the morning 99; in the evening 102 and sometimes 103 degrees; perspires considerably when sleeping; face becomes flushed toward evening. Sputum was examined before treatment and showed a great number of tubercle bacilli, also streptococci. On percussion I found dullness on the right side from the clavicle down about four inches, also over suprascapular space; on ausculation, I could hear moist râles. I have been injecting serum in this case since November 3, daily, up to two weeks ago, and intend to continue. This case did not get along very well but we have been rewarded at last. The temperature does not go above 99; she coughs and expectorates very little. I do not hear moist râles on ausculation. Her weight has increased from 110 to 118 pounds; respiration is not so frequent and she does not perspire at night. When she came to me she could not speak above a whisper. I examined the larynx and found the vocal cords red. On the left cord was a small ulcer; since the treatment with serum her voice has been entirely restored; the ulcer cicatrized. I have treated this case with Paquin's anti-tubercle serum, commencing with 10 and increasing to 50 ms., but had to reduce it to 25 ms., on account of palpitation of the heart. I think it very advisable to discontinue the injections for about two weeks in cases where patients have been injected daily for three or four months.

Dr. Elizabeth McLaughry, New Castle, Pa., in one of her recent reports states:

Patient, a young woman, age 32, had been ill for two years,

gradually growing weaker. When I first called, found her prostrated with a temperature of 104, pulse 120. Cavity in left lung and dullness in apex of right, dyspnea, huskiness of voice, night sweats, cough, which prevented her from sleeping; sputum, muco-purulent, often streaked with blood. No appetite, throwing up what food she did take, and diarrhea. Weight 84 pounds. Bacilli very abundant in sputum. Began treatment by injecting five minims of serum—increasing to thirty daily. She began to improve at once; temperature gradually went down to normal in less than two weeks, night sweats ceased, coughed much less, slept soundly all night, appetite became good and diarrhea ceased. Now after two months treatment, she has grown quite strong; gained four pounds.

Dr. Richard Fricke, Fort Wayne, Ind., April 28, 1896:

Case 1.—Mr. S., a man 37 years of age, was taken sick January 4 with typhoid malaria. About the beginning of February the fever had disappeared, and there were no symptoms, except weakness. But after about one week's time a hacking cough set in, with but little expectoration, and at the same time, he began to get asthmatic, losing flesh and having night sweats. I learned that several members of the family had died of consumption. By examination, I find the apices dull and contracted. The microscopic examination was negative. March 4 I began to inject the Paul Paquin anti-tubercle serum. After about one week's treatment he began to feel better, his appetite improved, his night sweats grew less and at the end of the second week he had gained four pounds. From that time he improved rapidly in every respect and gained an average or three pounds a week. He lost his night sweats, his asthma, got strong and robust and is now at work again. During the treatment he did not take any medicine except the injections of serum.

Ed. W., St. Louis, Mo. Examined July 9, 1895, complained of sore lungs, both sides for two years. Dullness in left apex; cough slight; expectorated, thick yellow sputum, containing bacilli of tuberculosis. Dyspeptic. Bowels irregular; had lost seven pounds in preceding three months. Was treated with an average dose of 30 ms. almost daily since examination, and to-day is absolutely free from tuberculous phenomena, although he has a slight catarrhal discharge with micrococci. He has regained lost strength and weight.

It is useless to say that the improvements in cases in very advanced disorganization and prostration have not been of long duration. Nothing will restitute a lost tissue to its former condition, nor will anything cure moribunds.

DISCUSSION.

Replying to the interrogatories by Dr. William Dougal, and others, Dr. Paquin said the serum would not kill germs outside the body as a chemic germicide; that the horse from which it was obtained was treated with tuberculin, or the toxins of the germs of tuberculosis, in a manner similar to that followed in producing diphtheria antitoxin. The horses were first kept under observation three or four weeks, and if there were the least indication of illness they were not used. The tuberculin injections in the animals were continued as long as they produced any reaction. It was usually three months before reaction ceased. The subsequent steps taken insured a very clear serum. The living germs of tuberculosis were not injected into the horse. Moreover, the horse was naturally relatively immune to tuberculosis, for out of many attempts to infect the animal he had succeeded only twice in producing even local tuberculosis, and this failed to become generalized. The immunized horse serum injected into tuberculous man did not kill the germs of tuberculosis, but, as with diphtheria antitoxin, simply stimulated the forces within us to neutralize their products. In diphtheria we found germs three or four weeks after the use of antitoxin. It was not at all due to chemic action.

DR. A. M. HAYDEN of Indiana—I have obtained the very best results in eight cases out of ten. The question most important to settle at the present time is, what cases will be benefited, and under what circumstances, and how to distinguish between cases which will be benefited and those which will not, I have been unable at the commencement to decide. A case in mind was that of a patient having an immense cavity in the left lung. Apparently he got no benefit from the treatment the first three weeks, but had the flushed face, disturbance of circulation, and seemed to lose ground for a month. But on examining the sputum we found the tubercle bacilli were diminishing. After thirty days the tubercle bacilli were very much diminished in the sputum, and he began to gain in strength, appetite, flesh, etc. In three months the tubercle bacilli had disappeared from the sputum, although they had been very numerous on the microscopic slide at the first. He had had hundreds of hemorrhages, and could not go out of the house alone. The other lung has cleared up, the chest wall has contracted over the cavity, he is at work and enjoying life. In one or two other cases there was improvement the first two or three weeks. Then it ceased and they lost ground. In 80 per cent. of my cases the results obtained have been better than those I have ever succeeded in getting from any other therapeutic agent. I discontinued all other treatment in these cases in order to give the serum a fair trial. One man whose condition was regarded as hopeless would take no other treatment, and the result was so favorable that I abandoned all other measures while using the serum. The man whose history was sent Dr. Paquin, and who had tuberculosis of the glandular system, coughed, was emaciated, had swollen feet, pulse 140, night sweats and insomnia. Everything else was stopped and he was given the serum. At the end of sixteen days he had improved sufficiently to get out of bed and had gained a number of pounds. The treatment was discontinued ten days or two weeks; he began to feel badly again, and another ounce of serum was sent for; soon afterward his weight increased to 170 pounds, and since then he has gained five pounds more, being heavier than he had ever weighed before. One of my patients who did not improve had mixed infection, and I believe it will be found that such cases are less likely to be benefited than those with purely tubercular infection. The other case which apparently improved at first, but relapsed afterward, was one of laryngeal tuberculosis. It is a peculiar fact that most of the cases in which I got good results did not seem to improve at first, whereas the two which at first showed improvement of appetite and some gain in flesh, afterward relapsed.

DR. RICHARDS and DR. WEBSTER of Illinois, inquired whether the serum had been used in local tuberculosis by injection.

DR. PAQUIN knew of only one case of lupus in which it was used, the report coming from the State of Washington. The physician stated that the disease had disappeared.

DR. WILLIAM DOUGAL of Illinois—It seems to me that by this treatment we are stimulating the natural forces within us to throw off and annihilate tuberculosis within the system.

THE SURGICAL TREATMENT OF UTERINE FIBRO-MYOMATA.

Read before the Minnesota State Medical Society, June 18, 1896.

BY E. C. DUDLEY, M.D.

PROFESSOR OF GYNECOLOGY, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL.

CHICAGO.

The object of this paper is not to enlarge upon a great variety of procedures which have become or seem destined to become obsolete, but rather to present briefly the more useful operations for the treatment of fibro-myomata of the uterus. The subject will be divided as follows: 1, palliative operations. 2, radical vaginal operations. 3, radical abdominal operations.

I. PALLIATIVE OPERATIONS.

The palliative operations are, *a*, curettage, *b*, electrolysis, *c*, ligature of the uterine arteries and broad ligaments, *d*, removal of the uterine appendages.

a. Curettage.—The irritating presence of the tumor often gives rise to hemorrhagic endometritis. Curettage is therefore indicated precisely as it would be in hemorrhagic endometritis from any other cause. The operation is generally followed by a degree of relief from the menorrhagia, is seldom permanent in its results and must usually therefore be repeated again and again. It is especially useful in connection with intrauterine gauze tamponade to control hemorrhage until an exhausted patient can gain blood and strength for a more radical operation, or in cases of small tumors until the menopause has passed. Curettage of the myomatous uterus gives increased danger of sepsis, hence the necessity for great antiseptic and aseptic care.

b. Electrolysis, especially electro-puncture, must be taken as a surgical procedure; even the simple intrauterine electrode is powerfully caustic and therefore surgical. Undoubtedly this agent may in a limited number of selected cases be capable of producing a more or less permanent symptomatic cure, and may occasionally result in the disappearance or reduction of the tumor. The earlier promise of its enthusiastic supporters however has not been fulfilled. Its immediate dangers also are considerable. The survival of this method depends chiefly upon the patient's ignorance of its inadequacy and dangers, upon her worship of the mysterious, upon an unreasoning dread of operative measures and upon a desire to grasp any other promising means of relief.

c. Ligature of the Uterine Arteries and Broad Ligaments.—The purpose of these measures is to shut off the blood supply to the uterus and by this means to induce atrophy of the growth. Gottschalk of Berlin reports cases of multiple myoma in which he he ligatured the uterine arteries with good results. Martin ligatures the whole base of the broad ligament so as to include not only the uterine artery but its branches and certain uterine nerves. He even goes so far in desperate cases as to ligature also the ovarian artery on one side. Robinson reports successful cases in which he has ligatured the Fallopian tubes and broad ligaments, including the ovarian and uterine arteries on both sides. The method has hitherto failed to elicit much discussion. Even its authors of late preserve on this subject an ominous silence.

d. Removal of the Uterine Appendages.—This procedure, which suggests the names of Battey, Hegar and Tait, when properly carried out—*i.e.*, when the ligatures are placed close to the uterus so as to include a large part of the broad ligament—usually stops the hemorrhage and reduces the tumor, sometimes even causes it to disappear. Its dangers however, are nearly if not quite as great as those of the more radical operations. This is especially true since the technique of the latter has been perfected. Removal of the uterine appendages for fibro-myomata is becoming an obsolete operation. At least it will be done only in rare cases of small tumors in which for some special reason the hysterectomy and myomectomy are unadvisable.

II. RADICAL VAGINAL OPERATIONS.

The vaginal operation is preferable when the tumor can be readily reached by that route. All cervical fibroids, all intrauterine pedunculated fibroids and some of the more accessible submucous fibroids have usually been removed by the vagina. In their removal the *ecraseur* and galvano-cautery so often used for hemostasis are unnecessary, because hemorrhage is either not feared or can be readily controlled by the uterine gauze tampon. This route has usually been reserved for the smaller tumors of a size not larger than the capacity of the small pelvis. Latterly however the vaginal method has been often and successfully used by certain French surgeons for the removal of much larger tumors. Their removal is accomplished by repeatedly seizing the presenting part of the tumor with vulcellum forceps and cutting away as large a piece as possible with the scissors, one piece after another, until the whole tumor has been removed. I refer to the operation by traction and morcellement. This method, although generally supposed to be of more recent origin, was really described by Dr. T. A. Emmet more than thirty years ago and has been constantly advocated and practiced by him ever since. It is applicable to those cases in which the tumor is accessible through the vagina but too large to be enucleated and delivered entire.

The operation of traction and morcellation when its technique is more generally understood and its advantages more appreciated will undoubtedly become more and more a procedure of election in place of hysterectomy. Many large submucous or mural tumors for which the abdomen is now opened and the uterus sacrificed may be rapidly, safely and effectually managed by this method. One strong contraindication to the vaginal route for large tumors must always be, however, the constant possibility of pus tubes or ovarian abcesses, so often unrecognized or unrecognizable when they occur in connection with large irregular fibro-myomata. Many a fatal result has followed the rupture of an unsuspected small pus tube caused by most careful enucleation or morcellation through the vagina. The vaginal route then should be avoided if there be any reason to suspect purulent disease of the uterine appendages. The tumor is usually made more accessible and its enucleation or morcellation is facilitated either by dilatation or more frequently by deep lateral incisions of the cervix even to the internal os. These incisions having been made, the anterior and posterior lips of the cervix are drawn well down to the vulva and held widely apart by means of strong double-tooth forceps in the hands of an assistant. The operator then seizes the presenting part of the tumor with strong tooth forceps and removes it, either by enucleation or by morcellation. If the tumor be of mural origin it may be necessary to divide the mucous membrane and submucous muscular tissue before commencing the enucleation. This incision should be parallel to the uterine canal.

I now propose a possible improvement upon the two lateral incisions. It is a simple median incision through the anterior wall of the uterus, as follows:

1. Make a circular incision in front of the uterus which shall separate the vaginal wall from the cervix at the utero-vaginal attachment in the line CD, Figure 1.

2. Incise the anterior vaginal wall from the point at the middle of the first incision for a distance of one-half to three-fourths of an inch, line AB, Figure 1, taking care not to invade the bladder and to avoid the ureters on either side.

3. Separate the bladder from the uterus by means of the finger or some other blunt instrument, keeping close to the uterus until the peritoneum is reached but not divided. Then expose with retractors the anterior wall of the uterus. (Figure 2.)

4. Divide the anterior wall of the uterus longitudinally in the median line by means of scissors to whatever extent may be necessary to render the tumor accessible. (Figure 2.) If necessary, the peritoneum may be opened and the incision carried high up into the corpus uteri.

This simple anterior incision would permit wide separation of the lateral fragments of the anterior uterine wall and thereby expose the endometrium and in selected cases would render accessible a myoma in any part of the uterine wall. It would probably have the following advantages over the lateral incisions:

1. Less traumatisms, one incision instead of two.
2. The parametria are not opened and exposed to possible sepsis.

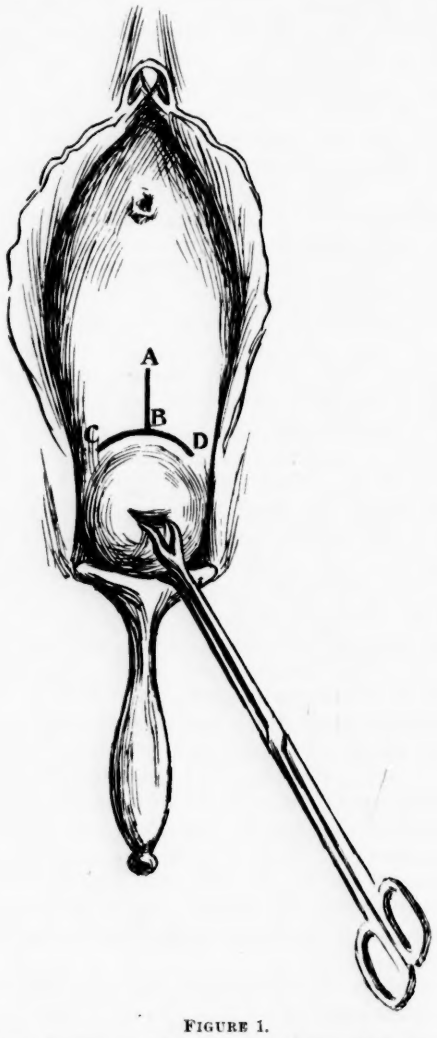


FIGURE 1.

3. The tumor would be more accessible because the anterior uterine wall would be out of the way instead of being between the operator and his field of operation.
4. A much longer incision may be made if necessary, because the broad ligaments are not involved.
5. Less hemorrhage.
6. The pelvic cavity may be easily reached for any accessory operation on the uterine appendages or peritoneum. Even a small pedunculated or subperitoneal tumor could be removed.

III.—RADICAL ABDOMINAL OPERATIONS.

The radical abdominal operation includes the following subjects:

1. The extraperitoneal versus the intraperitoneal treatment of the stump, *i. e.*, the clamp versus the ligature.
2. The removal of the tumor together with the whole or a part of the uterus and its appendages.
3. The removal of the tumor, leaving the uterus and its appendages intact, so as to preserve their reproductive functions.

The question of intraperitoneal versus extraperitoneal hemostasis recalls the old contest between the clamp and the intraperitoneal ligature in the treatment of the pedicle in ovariotomy; a contest which resulted in a complete victory for the ligature and necessarily established the general principle that the extraperitoneal method is relatively dangerous and consequently, whenever perfect hemostasis by the intraperitoneal method is practicable, should be avoided. Undoubtedly this general principle should apply with some force to the removal of other abdominal tumors. Nevertheless the earlier statistics in myomectomy and hysterectomy show that the dangers which necessarily belonged to the clamp were more than balanced by the insufficiency of any means then known of intraperitoneal hemostasis. The advocates of the clamp based their objections to the ligature upon the supposition that the moist soft uterine stump when ligatured and returned to the abdomen would at once become a source of danger from hemorrhage and decomposition, with consequent peritonitis and sepsis. However tightly the ligature was drawn around the uterine stump, however carefully the flaps of the stump were stitched together, however perfect the hemostasis may have appeared upon the completion of the operation, the fact

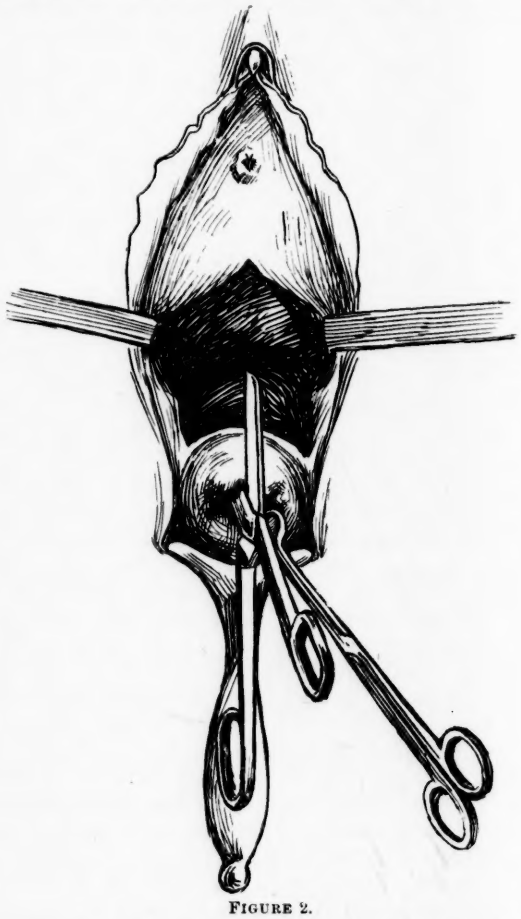


FIGURE 2.

remained that shrinkage of the stump within a few hours with consequent loosening of the ligatures almost invariably occurred from the escape of serum, and fatal hemorrhage or sepsis often followed. The extraperitoneal treatment therefore became for a time almost universal, and with improved technique gave promise of becoming the established method. In the hands of Keith and a few other extraordinary surgeons it gave a singular freedom from mortality; but in the hands of the average operator the mortality was unfortunately too great. This was so because of the extreme difficulty in keeping the stump aseptic. It would suppurate in many cases and become the medium of deep peritoneal infection.

In myomectomy the history of ovariotomy has repeated itself—first, the intraperitoneal treatment of the stump; second, the extraperitoneal treatment, rendered necessary on account of the difficulty of intraperitoneal hemostasis. Now, finally, the intraperitoneal treatment has become the established method in myomectomy.

The great condition hitherto wanting is now supplied by ligaturing the uterine and ovarian vessels, thereby shutting off the blood supply from the field of operation. This not only renders the operation bloodless, but prevents secondary hemorrhage. It now seems extraordinary that the very first men who ever attempted myomectomy did not realize the surgical necessity of first shutting off the blood current by ligaturing these vessels. Instead of using this simple, direct, natural procedure, we have been for a quarter of a century, groping about in the dark, searching in out of the way places for a method by which we could secure intraperitoneal hemostasis. Just as soon as Baer and others began to ligature these vessels the whole procedure became simple. It is the old story of Columbus and the egg over again.

It would be unprofitable here to continue the discussion of the clamp against the ligature in the surgical treatment of uterine fibroids. The subject is rapidly passing out of the field of discussion and becoming a matter of history. There is, however, a limited class of cases in which the very much constricted stump may readily be brought into the abdominal wound, and fixed there by means of the clamp, in a much shorter time than would be required to secure hemostasis by ligature of the uterine and ovarian vessels, and to complete the operation by the intraperitoneal method. In such a case, if the condition of the patient is precarious, the clamp will always be useful, because it will enable the surgeon to complete the removal of the tumor with the minimum of operating. It will then fulfill a most important indication—the saving of time.

Nearly eight years ago I reported to the Chicago Gynecological Society a case[1] operated upon in St. Luke's Hospital, in which the abdomen was opened, the tumor enucleated, and the cavity from which the tumor had been taken stitched into the abdominal wound by means of catgut sutures. By this means the uterine wound made by enucleating the tumor was rendered extraperitoneal. The tumor cavity was then tightly packed with a continuous strip of gauze to control hemmorrhage and to drain through the abdominal wound.

This operation differs from the so-called "peritoneal cuff operation" recently introduced by Dr. Senn somewhat in detail, but not at all in principle. I have recently, however, learned that Dr. Polk, of New York, described substantially the same operation before the New York Obstetrical Society in January, 1888, thus anticipating me by a few months, but he soon abandoned it for hysterectomy. When I first described this operation I regarded it, for selected cases, as a great advance in the surgical treatment of uterine myomata, because it saved the reproductive organs. In about fifty cases it gave me a mortality of only 2 or 3 per cent. Now, however, I would usually prefer one of the modern intraperitoneal operations soon to be outlined.

The grounds upon which the extraperitoneal method, whether by clamp, elastic ligature or suture, should for the most part be discarded, may be given as follows:

1. No greater safety in the extraperitoneal method.
2. Fixation of the whole or a part of the uterus to the anterior abdominal wall is objectionable from an anatomic standpoint, and often gives the patient great inconvenience from traction and from other mechanical causes.
3. Extraperitoneal hemostasis in any form is apt to cause unnecessary adhesions. It usually makes a longer and more tedious convalescence.
4. Greater danger from ventral hernia.

OPERATIONS WITH INTRAPERITONEAL HEMOSTASIS.

To illustrate the various operations which may be performed with intraperitoneal hemostasis, I will briefly present from my note books the histories of three operations performed at St. Luke's Hospital on three consecutive days, Nov. 4, 5 and 6, 1895.

Case 1 was of many years' standing. Electrolysis—electropuncture—had been repeatedly used. This treatment had been followed by extensive, almost fatal pelvic peritonitis, There had been so much inflammation of the tumor itself that it could not be easily shelled out of its capsule. On account of extensive adhesions to the abdominal viscera, the inaccessibility of the field of operation and the bad condition of the patient, the operation presented unusual difficulties. After ligating the uterine and ovarian vessels, the tumor, weighing about ten pounds, and the entire uterus with its diseased appendages, was removed. The operation necessitated great traumatism in the pelvis, and large surfaces were left uncovered by peritoneum. The pelvic cavity was therefore packed with gauze. This gauze was continued into the vagina and left as a capillary drain. The abdominal wound was closed without abdominal drainage.

Case 2.—The next case was very much like the preceding one, but the tumor was somewhat smaller and there were no adhesions. Both tubes were distended with fluid. Each ovary was as large as the double fist. The tumor, the entire uterus and its appendages were removed, as in Case 1. The broad ligament stumps were drawn down into the vagina and held there by sutures. The vaginal and abdominal wounds were both completely closed, the latter with catgut sutures. No drainage.

Case 3.—On the following day the third case presented itself, with a perfectly round, globular tumor as large as the double fist springing from the anterior wall of the uterus. This tumor was removed by an incision through the corpus uteri, precisely such as would be made in a Cæsarean section. Temporary hemostasis was secured by a rubber ligature. This was removed before closing the abdominal wound. The tumor having been enucleated, the cervix dilated and the granulations curetted out of the endometrium, the cavity of the uterus, which communicated with the uterine wound, and the vagina were packed with a gauze drain. The uterine wound from which the tumor had been enucleated was then closed. As in Cæsarean section, the entire uterus was dropped back into the pelvic cavity and the abdominal wound closed without drainage. The Fallopian tubes and ovaries were preserved intact.

The method adopted in this last case is undoubtedly applicable to the treatment of a much larger

[1] Reported before the Chicago Gynecological Society, May, 1889, and published in the Am. Jour. of Obstetrics, September, 1889.

number of tumors than is generally supposed. I desire to emphasize the statement that any surgeon who is constantly alert to enucleate the tumor and preserve the reproductive organs will be surprised at the number of cases in which this is entirely feasible. The mutilating operation of hysterectomy for fibro-myoma is often necessary, but not so often as the statistics of the present time would indicate. In the vast majority of cases the uterine appendages will be found normal, and in a large proportion of this majority the tumor may be enucleated from the uterus and the wound successfully closed precisely as would be required for the removal of such a tumor in any other part of the body. Cases of very large tumors and cases in which many small tumors are scattered through the uterine wall may require hysterectomy. The conservative operation of simple enucleation will apply in many cases when the tumor is even larger than the fetal head, and in cases of multiple myomata when there are not too many tumors.

If the tumor is subperitoneal, and especially if pedunculated, the uterine traumatism is superficial and easily treated with catgut sutures. In mural tumors large numbers of buried catgut sutures may be used in bringing the surfaces of the uterine wound together, and then some modification of the Lembert suture may be used in closing the peritoneal margins. If the tumor is submucous and the uterine cavity is invaded in its removal, the same method of buried suture applies. In these cases it is well to tampon the uterine canal and vagina for drainge with a continuous strip of sterilized gauze. The question has been raised whether the wound made by enucleation of a mural tumor without entering the endometrium should be simply closed with buried catgut sutures and left without drainage into the uterine canal, or whether an opening should be made into the endometrium for that purpose. I have operated several times in both ways, and always with success. I recall one case, however, of large tumor, the enucleation of which made a very large wound in the uterine wall. This was closed with buried catgut sutures without establishing any drainage into the uterine cavity. The patient recovered, but only after a period of high temperature and rapid pulse which lasted for about two weeks. During this time the uterus was enormously swollen and I feared suppuration in the uterine wound. Nothing, however, was done in the way of a secondary operation for drainage. The experience of this case indicates that drainage into the uterine cavity is desirable for large uterine wounds. In the introduction of the gauze tampon I always dilate the uterine canal from the abdominal side, the temporary elastic ligature being in place around the cervix, and then force a continuous strip of gauze three or four inches wide down into the vagina, packing the vagina first and then the uterine cavity. All of the gauze may be removed in forty-eight hours by traction from the vagina. If not removed within two or three days it is apt to produce high temperature and rapid pulse, which usually subside promptly upon its removal.

I have presented these three cases, all of which recovered, to illustrate the fact that there can be no stereotyped operation for uterine myoma. Each case must furnish its own indications for the particular operation which applies to it. Sometimes the entire uterus and its appendages must be sacrificed; often they may all be preserved and their functions restored; sometimes the cervix uteri alone may be left, after the method of Baer. Often, as in Case 1, the injury to the pelvic peritoneum is so great that gauze packing is necessary for drainage and hemostasis. In other cases the injury is so slight that when the ligated stumps are drawn down into the vagina and the vaginal and abdominal wounds are closed there is no peritoneal traumatism save the united wounds, and therefore no need for gauze packing. The modern tendency is properly on the side of the vaginal drain as against drainage through the abdominal wound. When no opening has been made into the vagina in the course of the operation proper, and drainage is necessary, I would favor as a general proposition that such an opening be made there, posterior to the cervix, for the purpose of drainage. The advantages of this are, 1, better drainage; 2, complete closure of the abdominal wound; 3, consequent rapid convalescence; 4, minimum risk of ventral hernia.

In myomectomy the uterus should, if possible, be saved when the tubes and ovaries are healthy. When the appendages have to be removed, the uterus may as well go with them, especially if its removal facilitates drainage or in any way renders the operation more simple. I do not, however, share a certain modern prejudice against the uterus, which would prompt one to remove it simply for the purpose of getting it out of the way.

1617 Indiana Avenue.

NOTES ON TAKA-DIASTASE.

BY T. H. ALLEN, M.D.
NEW YORK.

I have been using taka-diastase recently in a large number of cases, my attention having been called to it some time since by a physician whom I met in consultation.

It has been efficacious in such cases of amylaceous indigestion as are so frequently met with in gynecologic practice, and which seem dependent on irritation of the sympathetic governing digestion. The following case best illustrates its effect:

Mrs. H., aged 38, had chronic ovaritis with intense pain in left inguinal region, flatulency, headache, colic occasionally. The ovaritis had been treated in the usual way, but the intestinal pains depending upon the flatulency and headache, resisted all remedies until I administered the taka-diastase in three grain doses after each meal. The result was remarkable in its promptness; at the end of three days the tympanites and pain had completely disappeared. I continued to use the remedy during two weeks, after which time there was no return of the symptoms. The ovaritis is yet being treated.

Instead of giving in detail a report of the cases in which I have seen so much benefit derived from the use of taka-diastase, I will only mention one other case. Mrs. X., aged 26; fibroid of the uterus. Owing to the continued loss of blood she was very anemic and very much run down generally. She suffered from flatulence and digested starchy foods poorly. The relief of her intestinal symptoms and increase in weight was marked soon after she began to take the remedy.

In treating cases of this kind, where there is an abnormal degree of acidity in the stomach, I have in some cases given a dose of bi-carbonate of soda or lithia immediately before eating, thinking that by

lessening the degree of acidity the digestive properties of the diastase were less apt to be interfered with.

I consider taka-diastase a valuable addition to our newer remedies and do not hesitate to recommend it most cordially for the various forms of amylaceous indigestion. I might add that a very large proportion perhaps more than half, of the cases of indigestion we meet with are of the amylaceous variety, and the reason why we are so often disappointed in the use of pepsin is that we give it in cases needing a ferment to aid in the digestion of starches and not proteids.

52 West Forty-fifth Street.

SOCIETY PROCEEDINGS.

British Medical Association.

Sixty-fourth Annual Meeting held at Carlisle, Eng., July 28-31, 1896, under the Presidency of William Barnes, M.D., F.R.C.S., J.P., of Carlisle.

[Reported for the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.]

The proceedings began with a meeting of the Council, and was followed by a general meeting in the new Public Hall. Subsequently a special service was held in the Cathedral, it being attended by a considerable number of medical men and their friends. The Bishop's sermon was appropriate to the occasion.

At the second general session the report of the Council was presented and adopted. It showed the Association to be in a satisfactory condition, both as to its finances and membership. Last year the number of members on the books was 15,669. During the past year 1,240 had been elected, 145 had died and 442 had resigned, leaving on the books 16,332.

Reports of various committees were also presented and adopted.

DR. CHARLES PARSONS of Dover was elected Treasurer of the Association.

A resolution was introduced and adopted, requesting the Ethical Committee to draw up a Code of Professional Ethics to be submitted to the Association for discussion and ratification.

PRESIDENT BARNES then delivered his address, an abstract of which we give herewith:

THE PRESIDENT'S ADDRESS.

He selected for his subject "The Medical History of Carlisle." At the outset he stated that it was assuredly a distinction of no common kind to be elected President of the British Medical Association, the largest and most powerful medical association which the world has ever known. Having its origin in a small provincial city sixty-four years ago, it had grown and prospered, and now numbered among its members all that was most distinguished and eminent in the profession. When he looked back to the long list of distinguished men who had preceded him in this position, his mind was filled with misgivings, for the list included names of men distinguished alike for their high literary and professional attainments. The only claim which he could advance was that he had worked for the Association for nearly thirty years.

After a brief sketch of the general history of Carlisle, the speaker passed on to matters of medical interest and importance. He spoke of those eminent Cumbrians who had contributed to the advance of medical science, and of the conditions of life which existed at various periods. The question as to whether the Roman armies were provided with medical officers was one which had not received much attention from archeologists. In many of the works on Roman antiquities there was no allusion whatever to it. The practice of medicine was not much encouraged in the early days of Roman power, and its professors were not held in high esteem. The surgical treatment of disabled Greek warriors was minutely described in many parts of the Iliad, and in Xenophon and other Greek writers reference was made to the services rendered by surgeons in times of warfare. But neither in the Roman classics nor among the writings of the Greek physicians who practiced in Rome are there any direct notices relating to the medical and surgical care of the numerous and scattered armies employed by Rome in different parts of the world. Celsus, it is true, lays down very distinct and practical precepts for the extraction of war weapons from the bodies of the wounded; but neither he nor Paulus Ægineta make any allusion to the appointment of physicians and surgeons as a part of the regular army. Bitter military experience, however, proved in ancient times, as it has often done in modern times, the necessity of having an efficient medical staff in connection with the armies in the field, and in no part of the world was this more clearly shown than in this part of Britain. Some modern discoveries in this part of Great Britain and elsewhere have demonstrated that in the time of the Empire, at all events, the armies of Rome were provided with a medical staff. Among the many monumental tablets which have been discovered along the course of the great Roman wall there is surely none more interesting than one which was discovered a few years ago at Houseteads. The inscription shows that it was erected by the first cohort of the Tungrians to the memory of their "medicus ordinarius." This cohort distinguished itself under Agricola at the battte of Mons Grampius, and was afterward engaged in the erection of a portion of the more northern Roman wall of Antoninus.

Another point in connection with the early history of Carlisle is deserving of notice. One of the earliest institutions established for the reception of cases of leprosy in this country was placed just outside the city walls. It is not quite certain at what period leprosy was first introduced into England, but it must have been fairly common before the date of the Norman conquest, as he finds it the subject of legislation in the codes of a Welsh king, Hoela Dha, or Hoel the good, who died about the year 950. In the laws relating to married women, it is enacted that a wife may leave her husband without losing her dower if the husband become a leper. It is reported that Lanfranc, Bishop of Canterbury, who died in 1080, founded two hospitals at Canterbury, one for general diseases and one for leprosy. Some years ago the speaker investigated the records of the leper hospitals connected with the counties of Cumberland and Westmoreland. These were three in number, but the Hospital of St. Nicholas at Carlisle was the wealthiest and most important. The earliest records of which he could find any notice date back to the year 1180. There is a general concurrence of opinion that it had a royal foundation, and some historians believe that it was founded by William Rufus. If this be so, it was one of the earliest institutions of the kind in this country. Leprosy seems to have been a fairly common disease in this part of England, there being several hospitals for lepers in the adjoining counties of Cumberland, Westmoreland and Northumberland, three of which provided accommodation for ninety-one lepers.

At the close of the thirteenth and in the early part of the fourteenth centuries the city of Carlisle was the scene of many events in the history of England. Here within our walls three parliaments were summoned by Edward I, the father of parliaments. Here, in this remote corner of the English kingdom, probably for the first time in the world's history, the question of river pollution was brought under the consideration of a parliament. The Earl of Lincoln came to the Carlisle Parliament to seek redress for the restriction of the channel of the river Thames and its general condition, being so restricted by filth and refuse. The Earl prayed that "the Mayor, Sherifs and discreet Aldermen of London may inspect the river Thames, and restore it to its former condition." The matter having been considerered, orders were given by Parliament that impediments to the course of the river caused by filth and the refuse of barnyards be removed. This early recognition of the evils of river pollution by a parliament met to consider the general business of the country is a striking testimony to the value attached to sanitary legislation by our ancestors, and the prompt action which was taken contrasts strongly with the tardy legislation of modern times.

During the dark period of the Middle Ages there is little medical progress to record in connection with the history of the district. In common with other parts of the country medicine was here under a cloud, and we find abundant evidence of the faith in charms, witchcraft and the miraculous gift of healing supposed to be the special attribute of the reigning monarch. Several persons suffering from the king's evil were certified by the clergy and church wardens, or by the local justices, and sent to obtain the royal touch in order that they might obtain that restoration to health which the physicians of the day were powerless to give. Much of the ordinary medical practice was in the hands of irregular practitioners, and apparently a good deal of domestic doctoring was done by the heads of families. A few extracts from the account books of Sir Daniel Fleming of Rydal, shows the value which attached to

the services of regular and irregular practitioners. Under date of Aug. 10, 1658, there is an entry, "Given unto George Brown of Troutbeck, a bonesetter, when Will was hurt, 00 02 06. August 11. Given unto William Story of Seadgewicke, neare Sighser, bonesetter, for lookeing at Will's thigh, 00 07 06. August 12. Given unto John Rawling, a bonesetter for Will, 00 01 0." The services of these three irregular practitioners do not seem to have been of much avail, for the account book shows that a certain Dr. Dykes obtained "for comeing and laying plasters unto Will, 00 10 0;" and at a later date, "for his plaisters and paines contributed towards the cure of Will, the sum of 05 00 00." The same account books also show the value of the services of a midwife. Under date July 30, 1659, there is this entry: "Given unto Daniel Harrison's wife for being my wife's midwife, 00 05 00."

In the eventful history of Carlisle the visitations of the plague have at times caused serious calamities; occasionally the disease has swept away such multitudes that the living were scarcely sufficient to bury the dead. One of the most notable epidemics was the great plague of 1598, which is alleged to have caused a mortality of 2,260 at Penrith, 2,500 at Kendal, 2,200 at Richmond and 1,196 at Carlisle. These figures, which are taken from an inscription on a stone in the chancel of Penrith Church, have given rise to considerable controversy. The Carlisle parish registers do not go so far back, and the Penrith registers only record the deaths of 583 persons from plague at this period. It is therefore now believed that the numbers refer to the mortality in the rural deaneries bearing the abovementioned names. Another great plague occurred in many parts of the country in 1623, and a third occurred in 1646. Of the former we find evidence in many local parish registers, but of the latter we have few particulars. The historic MSS. of the mayor and corporation of Carlisle, under date 1649, contain the following reference: "It is ordered that John Diffecke, bellman, shall have forthwith paid to him . . . the sume of forty shillings in consideration of his labour and paines during the time the heavy judgement of Plague continued in this place in the year 1646." The circumstances of the town about this period were such as to make an outbreak of the plague exceedingly probable. The citizens had suffered much from wars for a series of years. In July, 1644, it was seized by Royalists, and was besieged by Lesley in October, the siege lasting many months. It had a garrison of about 700. About the end of February all the corn was seized to be served out on short allowance. On June 5 "hempseed, dogs and rats were eaten." All Cumberland was in such a state of destitution that Parliament ordered a collection for its relief; numbers of the poor are said to have died in the highways, and 30,000 families were in want of bread.

In the evolution of its sanitary administration, progress has been somewhat slow in Carlisle. During the Middle Ages, the government of the town was first vested in the free merchants' guild, which in later times became the town council. The Governor or Dormont Book, which bears the date of 1651, contains a code of by-laws for the government of the city, and among them are many useful sanitary edicts. It is ordained that, "If any person or persons hereafter caste any manner of corruption as deyd dogs, catts, nolt hornes, or any other thinge corrupte in any of the common wells of the city, or do place any midden or dunghill towards any of the said wells or within twelve feet thereof, he is to be fined for every offence 6s. 8d. to be levied of his goods, or else to be extremely punished by the Mayr as of the pillorie or otherwise." Swine are not allowed on the common streets; for the first offence the penalty is 6d., for the second 12d., and for the third the swine are to be forfeit to the "Mayr and balif." Penalties are also ordained against inhabitants who fail to keep the forefront clean to the middle of the pavement, and middens and dunghills are to be cleared away within eight days.

The Chamberlain's accounts of the city contain several items of expenditure for cleaning the town dykes, removing dead animals, etc., and during times of pestilence special precautions were taken to prevent the introduction of the disease. The following is the heading of one of the accounts: "Disbursements in attending the gaittes in the time of the seakness being at Newcastle beginning the iii of August, 1603."

In 1874, however, voluntary agencies were superseded and a regular sanitary administration established. A medical officer of health was appointed, who has since published annual reports of the health of the city. From these reports it is possible to judge of the results to some extent of sanitary administration by comparing them with previous periods. The earliest data upon which any reliance can be placed are the bills of mortality drawn up by Dr. Heysham. In the eight years between 1779 and 1787 there were 1,615 deaths, being at the rate of 24.9 per 1,000. In 1788 to 1795 the rate rose to 26 per 1,000, while from 1796 to 1800 it was only 23.3. In the ten years from 1800 to 1810 with the average population at 12,660, the death rate was again 23.3 per 1,000. It was upon these tables that the Carlisle tables of mortality were founded, which afterward became so much used by life insurance offices. The complete tables of the first period are the only ones to which he had access. The most fatal disease in the list is smallpox, which caused 238 deaths. Consumption was the cause of 214 deaths, 204 deaths were due to the weakness of infancy, and 226 are set down to the decay of old age. There were 493 deaths due to what we should now classify as zymotic diseases. Between 1842 and 1848, with an average population of 24,000, the death rate varied from 24.25 to 43.92 per 1,000. Since the publication of the reports of the medical officer of health there has been a steady fall in the death rate. In 1874 it was 32.6; in 1875 it was 29.2; and in 1889 it had fallen to 18.1. In 1874 the zymotic rate was 11.3; last year it was only 0.8.

Dr. Barnes closes by saying that the question of the improvement, training and restriction of midwives was one to which much attention had been devoted, and it was one which called for a speedy settlement on a satisfactory basis as much in the interest of the public as of the medical profession.

The present unsatisfactory state of the law relating to Certificates of death and Coroner's Inquests had often been under consideration and steps must soon be taken for its amendment.

The compulsory registration of stillbirths was another matter of urgent necessity. These were all matters in which the public was as much, or even more concerned, than the profession. Free discussion in meetings like the present would lead to more definite views of public and professional requirements, and he concluded with the hope that the deliberations at this meeting would help to further a settlement of some of these questions.

Sir DYCE DUCKWORTH, M.D., LL.D., F.R.C.P., delivered

THE ADDRESS IN MEDICINE.

He selected for his subject "The Importance of Prognosis of Disease." The first part of the address was largely historic. In recent times the literature relating to prognostics had been far to seek, and the speaker knew of no work purely relating to the subject which had been published in this century. He dwelt at length upon acute specific diseases, after which he discussed chronic infectious diseases.

The prognostics respecting syphilis relate largely to individual peculiarities, habits and environment, to the adequacy of treatment, and the degree and virulence of primary impregnation. It is certain that the greater number of persons so infected ultimately recover satisfactorily if they have been properly treated from the outset. It is equally certain that the character of the primary lesion does not enable us to prognosticate the ultimate evolution of the malady.

Pyemia and septicemia.—If organisms be present in the blood of the patient, and capable of cultivation from it, the prognosis, according to Kanthack, is bad.

Prognosis in relation to tuberculosis is a large question. The factors on which determination has to be made vary greatly with the individual and his environment. Without doubt the prognosis of all disorders of a tuberculous nature admits of a more hopeful view than formerly.

Cancer of the stomach commonly proves fatal within a year from the time a certain diagnosis is made. Those cases last longest and have less suffering in which neither orifice is involved.

In cirrhosis of the liver, if signs of toxemia set in, life will not be prolonged many days. Tapping of ascitic fluid may aggravate the nervous symptoms of such toxemia. If a free collateral circulation is gradually established between the portal and systemic veins, life may be prolonged for some years. A recurrence of either copious hematemesis or melena is generally fatal.

Cancer of the liver is usually fatal within twelve or fifteen months, but rapidly growing tumors sometimes in a few weeks. Cancerous growths of the peritoneum commonly kill within a year.

Gallstones.—The prognosis of cases in which gallstones are believed or proved to exist in the gall bladder is always uncertain. Many may be present for years and give rise to no or few symptoms; or a few may be present and cause serious attacks of biliary colic. Continued irritation from them may induce cancer of the gall duct, the gall bladder and the liver. Obstruction of the small intestine, commonly the ileum, is sometimes a grave complication due to plugging by a biliary calculus. A calculus may be removed from the bowel and the gall bladder emptied of calculi with complete relief of all untoward symptoms. Although unaware of any treatment by diet or by drugs which can cause removal of calculi already formed, their

further formation can certainly be prevented by appropriate medical procedures.

Typhlitis.—Many cases recover under judicious medical treatment. Perityphlitic abscess, if opened carefully about the ninth or tenth day, and the peritoneal cavity escape contamination with its contents, may generally heal favorably. Earlier surgical interference is very apt to lead to a fatal issue by toxic peritonitis. A gangrenous state of the vermiform appendix, if diagnosticated, demands an early operation.

In diseases of the heart the outlook is generally better than it was half a century ago. Pericarditis of rheumatic nature is very rarely fatal *per se*. In Bright's disease pericarditis is commonly fatal, and septic pericarditis is uniformly so. With the practice of aseptic surgery purulent pericarditis is no longer necessarily fatal. Tuberculous pericarditis may be rather protracted, but is beyond recovery. Pneumo-pericardium is commonly fatal within two days. Rupture of the heart is generally promptly fatal, whether from injury or as a result of muscular degeneration. Tachycardia demands a very cautious prognosis. The outlook in Grave's disease is uncertain. One case in three may recover. In the viable class of congenital malformed heart life is rarely prolonged over puberty. A better prognosis for longevity attaches to lesions of the aortic orifice, which are however rarely encountered. Life may be prolonged to the third decade in these cases. Ulcerative endocarditis is almost always fatal.

Aortic aneurysm.—No certain prognostics can be laid down in cases of this disease. Sacculated aneurysms of the ascending part of the thoracic arch, pressing forward, are commonly very chronic and cause least interference with vital structures, but they may vary in the direction they take. In aneurysm of the abdominal aorta the prognosis is always grave.

Arcus senilis is perhaps more generally recognized as a diagnostic than as a prognostic sign of a degenerated vascular system.

Diseases of the blood and ductless glands.—Simple anemia in young women is apt to recur, but most cases will recover if vigorously treated at intervals for three years. Pernicious anemia admits now of less grave prognosis than formerly owing to treatment with arsenic and marrow. Examination of the blood may help us in prognosis. Kanthack considers a steady diminution of leucocytes a bad sign and no less grave is an increase of the nucleated red corpuscles with a progressive diminution of hemoglobin. Leukemia generally proves fatal within two or three years. The pure lymphatic form is the gravest. Hemorrhagic tendency is of evil augury. In Hodgkin's disease recovery is rare, most patients die within two years. A fatal result is usual in Addison's disease within two or three years, but life may be prolonged for six or eight years.

Diseases of the kidneys.—Anuria of the obstructive variety, unless relieved by surgical measures, generally proves fatal within two weeks. The prognosis in respect of albuminuria is only to be framed by full consideration of all the features of each case. Chyluria of the non-parasitic variety may last for many years without disturbance of health. Chronic nephritis, tubal, interstitial or tubulo-interstitial often runs a protracted course. Prognosis can be framed only by a consideration of all the personal and diathetic factors in each case.

Diseases of the nervous system.—Taking the whole group of conditions due to neuritis, we may affirm that our prognosis is guided by consideration of the etiology and personal factors in each case. Early recognition of the nature of the disorder and of the peccant matter which has induced it is no less important than early treatment. The cases often last for years, but the results are quite remarkable if treatment be persisted in.

The prognosis in Ménière's disease is always uncertain. Recovery may occur, but deafness is the most frequent result. The symptoms may persist through life. In torticollis complete recovery is rare. In essential paralysis of children the outlook is certainly less grave than formerly if assiduous electric treatment be long carried out from the outset. In locomotor ataxia no absolute cure is to be expected. Cases setting in violently are often devoid of the characteristic later symptoms, and an arrest of the disease may ensue. This is especially noted after the occurrence of early optic atrophy. In aphasia the prognosis is only hopeful in the young, who may be educated again in the right cerebral hemisphere.

Cerebral apoplexy.—Prognosis in this condition chiefly relates to the particular locality involved and the size of the blood clot. Pontine hemorrhage is uniformly fatal, generally within a few hours, and so is that into the ventricles. The gravest indications are deepening coma, rising temperature two days after the hemorrhage and Cheyne-Stokes respiration.

Chorea.—Cases of this disease admit of a generally favorable prognosis at any age below puberty. At that period, and after, the outlook is much more grave. Chorea insaniens is a very dangerous form. The average duration of the disease is ten weeks and three days.

Epilepsy.—The truth of Hippocrates' aphorism respecting this malady is still attested: "Epilepsy supervening before puberty may undergo a change, those cases arising after the age of 25 for the most part terminate in death."

Roderick Maclaren, M.D., of Carlisle, delivered

THE ADDRESS IN SURGERY.

His subject was "Preventive Surgery." He claimed that it was a product of modern times, the outcome of recent advances in the knowledge of the intimate causes of disease, of the introduction of anesthetics, and of perfected methods of wound treatment.

The conditions which render preventive operations justifiable were next considered at some length. Passing on to anesthetics, the speaker said that surgeons no longer inflicted pain during any operation. This had been a solved question for fifty years; and in this, the jubilee year of anesthesia, he thought it not inappropriate to call attention to a development of surgery which hangs entirely on its use. There are still, however, longings after the perfect anesthetic, which should be as portable, manageable and pleasant to take as chloroform; as capable of long use as either chloroform or ether, and yet as safe and free from after-effects as nitrous oxid.

For miminizing after-pain, much rests with the individual surgeon. If he avoids by direction of incisions all unnecessary injury to nerves, if he manipulates as gently as possible, if he leaves his wound free from tension either by tight sutures or contained blood-clot, secures the most restful position, and ensures for his wounds a normal healing, he may do extensive operations with exceedingly little after-pain.

A large amount of preventive operative surgery has a casual connection with the throat and naso-pharynx—diseased conditions, to which are given different names, branch in various directions from this locality as a common center. They are conditioned by the various tissues and localities they subsequently affect, by their rate of spread and by their surroundings, and they give rise to appearances entirely different and which often seem to be separate diseases till we go back to their essential nature and cause. Under ordinary circumstances the inspired air entering the body is free from organisms by the time it reaches the back of the nose. But when highly charged with impurities this is altered, and as the air there turns at angle and meets with a moist surface organisms and their spores are deposited. There are crypts, gland openings, and channels in which they find a home; if their nature be infective only a delicate and easily injured epithelium separates them from lymphatics and veins, ready to carry them to new fields. Even if this region remains their home they may cause tissue growth in the form of enlarged tonsils and adenoids.

The inflammatory swelling set up by organisms may hinder the exit of natural secretions from cavities, as, for instance, from the Eustachian tubes, giving rise to their distension with fluid and admirably fitting them to promote the further growth of microörganisms. These start a chain of changes which has often grave consequences. With the preventive surgery of this region there is no small risk of overlooking the original cause. Hypertrophied tonsils, adenoid growths, suppurating ears and glands are all so obvious that further investigation is apt to stop, leaving out of consideration the behind cause, though it should be removed as well as the visible lesions attended to.

Enlarged tonsils and adenoid growths produce some slight local discomfort, but the chief evil they do is in checking growth and nutrition. Children who are affected with them are generally small for their age, anemic, and ill-developed; their chests contracted and drawn in along the line of the rib cartilages. It is often striking to see the growth and development which follow the removal of large tonsils and the scraping away of adenoids. The guillotine operation for tonsils is wanting in precision, and very given to miss the lower portion of the tonsil, which may be much hypertrophied just out of sight. It fails moreover in those cases in which the enlarged tonsil is contained and hidden between the pillars of the fauces. The imperfect results which it so often gives have brought the operation into a certain degree of undeserved discredit from the frequency with which the portion left increases again. It is much more satisfactory to give the patient a deep anesthetic and deliberately cut out—or, still better, with a blunt director teaze out—the whole structure, doing an operation of precision.

Adenoid growths in the naso-pharynx produce similar remote effects to those of enlarged tonsils; their nature is presumably the same, and most commonly they exist together. So, generally speaking, the removal of tonsils is not a com-

plete operation without a scraping away of all growths. Few operations give so good results with so little trouble. In the throat is the common starting point of another set of conditions in which preventive surgery has given assured and brilliant results. From diseased and swollen mucous membrane, from secretions bottled up and cultivating organisms powerful for evil, a train of sequences is set up which may ultimately result in brain abscess or purulent meningitis. The middle ear may be converted by the blocking of the Eustachian tube into a full cavity with complicated recesses and chambers. These become the dwelling of many organisms, which set up suppuration and destruction of tissue, the ear drum gives way and opens a new channel of contamination, or it may be that an independent opening to the surface is formed behind the ear, and pus escapes there. Every case of suppurating ear should not be made the subject of operation, for many are amenable to treatment and are permanently cured. With many, however, treatment fails, and everybody who has a chronic suppurating ear goes about in deadly peril. It should be a rule to operate on every discharging ear which does not get right by treatment. The mastoid cavities should be laid open and converted into hollow cones; all diseased bone should be removed, all unwholesome structures scraped away and everything made suitable for speedy healing, not for the sake of the ear as an organ, not even for the sole purpose of removing the local trouble, but for the avoidance of the grave secondary risks which are always present.

He believed the view generally held by surgeons was that so long as hernia could be steadily kept up by a truss, which does not much incommode nor prevent the patient following his occupation, there was no necessity for operative interference. But if trusses fail for any reason to keep up the gut, if the truss is painful to bear and excites repeated inflammations of the sac, or if the patient's occupation requires exceptional activity, the time has come to operate. Perfect results can be got from almost all the present so-called operations. Whatever secures good closure of the rings effects a cure. The peritoneum is of hardly any value in aiding the integrity of the abdominal wall. If left in the ring it is undoubtedly a source of weakness by keeping open a channel and preventing a union of the stronger structures, but in itself it is a mere slack distensile membrane with little resistant capacity. It is on the union of the aponeurotic and tendinous structures, and oblique that we rely for real strength, and the more thoroughly we get these together, and the more they form a uniform sheet the less likely is the rupture to recur.

Among the miseries which may make long life a burden to its possessor there are none greater than those resulting from an enlarged prostate. It is much better to advise early operation than to wait for a desperate state of matters. We have a certain latitude of choice in operations. Supra-pubic cystotomy may be combined with perineal removal of portions of the prostate, or with perineal drainage, and finally we have castration.

Suprapubic cystotomy with removal of enlarged prostate, whether central or lateral, and the establishment of a clean low-level canal into the urethra, is at present the operation to be first considered, though every surgeon should be prepared to deviate from it should local circumstances show that this would be of advantage. The resulting mortality is small, perhaps not more than 1 in 10, and it must be kept in mind that the condition itself is a very fatal one. The mechanic result is that in at least 40 per cent. the bladder recovers its function, and in the remainder suprapubic drainage establishes a state of greatly increased comfort. Within the last three years a new operation has been introduced for enlarged prostate. Relying on the observed fact that atrophy of the organ follows removal of the testes, surgeons have performed castration. The operation is too new and the cases too few to allow of any decided opinion of its merits; the results, however, have been sufficiently good to justify its further employment. Cases in which the urine was offensive and loaded with mucus and requiring removal at frequent intervals are reported as, after operation, passing a healthy urine spontaneously, and as having no detectable enlargement of the prostate. In other cases, though complete cure has not followed, a large improvement has. From one or other method we have the possibility of preventing one of the most prominent terrors of old age.

Twenty or thirty years ago a physician or surgeon attending a patient with an acute condition of distended tympanitic and painful abdomen, a quick and small pulse, and drawn-up legs thought that he had fulfilled the whole duty of man when he had diagnosed peritonitis and excluded perforation of the stomach and obstruction. Who is content with such a diagnosis now? It has gradually become apparent to our minds that peritonitis has almost always its cause in some other lesion and that our investigation is not complete till we have localized that cause. We know also that the origin is very often indeed situated in the appendix vermiformis, that this tube is subject to several morbid states; it may be strictured, and the part distant from the bowel may distend with septic contents; it may ulcerate through; it may be the seat of tuberculous disease; foreign bodies may lie in it or concretions form; the whole thing may go gangrenous. As consequences of these we may have at one end of the scale a mere local disturbance passing away after a few days' discomfort or at the other a general rapid peritonitis followed by death. Between these extremes we find many degrees of severity of attack. Thus if a slow perforation occurs we have an abscess in the peritoneum, but shut off from the general cavity by adhesions. We probably hardly yet know the whole pathology of the appendix, but we know enough to form a good clinical idea in most cases of the essential state of matters.

A general peritonitis following perforation or a local abscess round the appendix demands immediate surgical interference; the stage is past when prevention can come in. The class of cases which falls within the domain of preventive surgery is that in which the appendix has not perforated, but in which it is subject to repeated attacks of distension, in which it inflames from retained concretions; indeed, when from any cause it is the subject of one or more inflammatory attacks of a severity short of immediate danger to life. Three views of surgical duty prevail. Some surgeons hold that the appendix should never be removed; that the probability of a putrid infection of the peritoneum during the necessary manipulations makes it an operation of unjustifiable risk, and that the prospect of natural cure is a more hopeful outlook. He believes this view is held by an ever-narrowing circle.

Another opinion strongly held both here and in America by men whose surgical work entitles their views to the highest possible respect, is that every appendix which has given rise to morbid symptoms should be cut down on and removed when in a quiescent state. The third view is that only after a repeated appendicitis and the failure of careful dieting does there exist the necessity for a preventive operation. The following arguments are adduced in favor of this view: The great majority of attacks are not repeated, after one all clears up, and no further disturbance occurs. Most instances of perforation are first attacks; an evidence that one seizure does not increase the probability of perforation in the case of recurrence and, lastly, that a milk and farinaceous diet and mild aperients are often successful in preventing return.

Another disease holds out the prospect of a wide field for the extension of the preventive principle, namely, carcinoma. There is much to learn about its nature. In the absence of knowledge we may use our reasoning faculties and make some effort to infer the unknown from the known. In cancer of the lip and in Paget's nipple are two instances in which the life-history is well made out.

Let us investigate the small and early changes. If we can find out the antecedent or even the first symptoms of carcinoma, we may then know how to prevent it. The recent developments of surgery in cancer have been in the direction of extensive operations and wide-reaching removal of tissue—wider than we dreamed of some years ago, for we are now aware that the visible disease is but a fraction of the total, and if we have far-spreading disease we must have sweeping removal. He thinks and hopes that there is in the future a preventive surgery founded on fuller knowledge, which will anticipate these great operations by small ones or, it may be, by such preventive measures as will do for cancer what we are steadily doing for so many other diseases—compress it within narrowing limits.

(To be continued.)

SELECTIONS.

Chloroform and Ether in Parturition.—Bukoemsky, of St. Petersburg, in *Monatschrift für Geburtshülfe und Gynekologie*, March, has given comparative research to the use of ether and chloroform in normal labor. He remarks that while many observers have studied the action of chloroform, but comparatively little has been done for ether. Bukoemsky carried out a series of experiments to determine whether ether or chloroform render labor painless and why they do so: what effect they have upon the contractile power of the uterus, upon the strength and frequeney of the pains and the interval between them, upon the dilation of the os, and the abdominal

pressure. He looked also for the irritative symptoms due to ether and chloroform, examining their action upon the kidneys, respiratory function, pulse, temperature and general condition. In the puerperal period he examined the loss of blood, the involution of the uterus, the lochia and the secretion of milk, and finally noted the effects on the child and the frequency and degree of icterus neonatorum. The following conclusions are drawn: 1. Ether undoubtedly diminishes the painfulness of uterine contractions in all cases and generally makes painless the actual birth of the child. Its anesthetic effect is most marked during the expulsion period, if the patient has been already partially under its influence. It does not prolong labor, but on the contrary seems to shorten it about one hour in primiparæ. It increases the force of the uterine contractions as shown by the toko-dynamometer. It does not lessen the length of the pains, but shorten the intervals between. "In respect of the secretion of milk, its effects were not unfavorable; in some cases the quantity seemed to be increased. Even in larger doses ether had no unfavorable effect on the fetus, which was in no case dull or narcotized when born. Icterus was less common and severe and the loss of weight was less during the first week. The best time for the administration of ether seemed to be when the os was dilated to the width of three finger-breadths; it seemed to have no effect upon the early dilation of the os. 2. Chloroform in small doses do not diminish the contractile power of the uterus. In the majority of cases examined the pains were shortened eight seconds, but in a few they were lengthened eight seconds. The intervals between the pains were generally lengthened 13 to 49 seconds. Although chloroform generally protects labor somewhat, it seems to have no ill effect on the mother when given in small doses. It is pleasanter than ether, but in a few cases slight irritative symptoms were noticed at the commencement of chloroform narcosis. It had no unfavorable effect upon the puerperal period, and in no case did hemorrhage occur when it was used in small doses. The children seemed unaffected by it, and a mild icterus occurred in about half the cases. The best time for administration is the same as for ether. In comparing the action of ether and chloroform it seems that ether is generally preferable, because it has less toxic effect upon the organism and does not produce such ill effects as chloroform if it has to be given in a relatively large quantity or for a length of time. Moreover, it shortens labor and has a more favorable effect upon the puerperal period and upon the fetus. As most of these patients were delivered at night, and a common coal-oil lamp was used in the room, there need be no fear of ether taking fire or exploding if ordinary precautions are used. From these observations it seems clear that either anesthetic may be used in ordinary cases of labor, if given carefully and in small doses, without injuring mother or child and without causing hemorrhage during the puerperal period. It is equally certain that chloroform may predispose to hemorrhage and injure both mother and child if given in too large doses or for too long a time. Chloroform should be selected when complete relaxation of the soft parts is required or when there is much spasm to overcome. Ether is preferable when deep anesthesia has to be maintained for some time, or when there is severe cardiac trouble, or when some operation has to be done after the conclusion of labor, such as the repair of perineal laceration or the removal of an adherent placenta. When chloroform has been given for some length of time during labor, the child is apt to be lethargic when born and does not begin to cry without considerable stimulation."

The Strychnia Cure of Alcoholism and Opium Habit.—A certain proportion of the submerged 4,000 who pass yearly through the alcohol wards of Bellevue Hospital distinctly and seriously wish to have a treatment given them which will take away their tendency to periodical sprees. Consequently the use of strychnia and the solanaceæ, with certain adjuvant tonics and moral influences, is employed in these cases. The technique of the treatment as arranged by myself has been carried out most skillfully and improved in its details by my house physician in charge of the alcohol cells, Dr. J. D. Brown. I am greatly indebted to him for the intelligence and faithfulness shown in his work among this class. The drugs selected for use in this "cure" are those which the experience of ten years in the care of these cases has shown me to be most useful. The suggestive and moral influences thrown about the "cure" are borrowed, I freely admit, from the Keeley and other alcohol cures of the country. Selected patients, after having passed through an attack of acute alcoholism, and are convalescent, are allowed to remain two days and take the "cure." The wards of the hospital are not large enough to permit of a longer stay. Only persons who have reasonable intelligence and who show real evidence of sincerity are chosen. The following solutions are used:

I. ℞. Strychnia nitrat . . . . . gr. 1-15.
Atropiæ sulph . . . . . gr. 1-300.
Aquæ distilled . . . . . m. x.
Misce. Sig. Inject t.i.d., first day injection.

II. ℞. Strychnia nitrat . . . . . gr. 1-20.
Atropiæ sulph . . . . . gr. 1-200.
Aquæ . . . . . ʒx.
Misce. Sig. Inject t.i.d., second day injection.

III. ℞. Tinct. cinchon. comp . . . . m. xv.
" capsici . . . . . m. ½ to m i.
" solan. carolineus. . . m. ii.
Vini ferri amari . . . . . ad ʒi.
Misce. Sig. Mistur. stomachic., ʒi t.i.d. Shake.

III. Order: ½ to 1 glass of milk (hot or peptonized), alternating with hot beef tea or broth, every two hours.

IV. First and second nights, if needed.
℞. Potas. bromid . . . . . gr. xxxii.
Chloral hydrat . . . . . gr.xvi.
Tinct. valerian. . . . . ʒi.
Aquæ . . . . . ad ʒiv.
Misce. Sig. ʒi dose, repeated once, if needed.
Shake. Mistur. sedativ.

The patients are given the injections I. and II. and "stomachic," III., three times a day, with abundant nourishment, washing out the stomach if necessary, to help any catarrhal disturbance. The patient, during the treatment, is made to understand distinctly that he is taking a "cure" with all that that implies, but no mystery is made of its character or of the means used. After the second day he is perforce discharged. In most cases his craving is gone, but this generally occurs after a debauch. In fact, the natural history of many cases of periodic alcoholism is that craving ceases after the spree for from one to nine months. On being discharged, the patient is given:

IV. ℞. Tinct. columbo . . . . . ʒi.
" capsici . . . . . m. xv.
" nucis vomic . . . . . ʒi to ʒiss.
Apomorphinæ . . . . . gr. ⅛.
Tinct. cinchon. co . . . . . ad ʒiv.
Misce. Sig. ʒi t.i.d. in water after meals.

The patient is told to take this and report weekly. After a month he reports monthly, and is kept supplied with the bottle, which he is told to take the minute any craving develops, and report at once. By the application of this method to alcoholics, we are able to send out many patients with hope in the future, confidence in themselves, and a staff upon which to lean in this weakness. The same treatment, when applied to patients with the morphin habit, has to be given much longer, and sometimes must be modified by adding bromids or gradually reducing the morphin. Dr. Brown was able in one case to stop imediately the use of morphin taken to the extent of 30 grains a day. The patient did not suffer in the least.—Charles L. Dana, M.D., in *Post-Graduate*, July, 1896.

Operative Treatment of Entropion and Trichiasis.—The lid is split in the ordinary manner along the whole border of the eyelid, or only a short distance if the in-curving of the lashes is but partial. The incision is placed well behind the roots of the cilia and is carried up into the substance of the lid a distance of from 4 to 6 mm. A second incision is then made through the skin on the outer surface of the lid, at a distance of from 2 to 4 mm. from the point of emergence of the lashes. This incision is continued parallel with the edge of the lid so far as the in-curving extends and carried down to meet the other, so that the edge of the lid from which the lashes are growing is then completely detached, except at its ends. But the incision is not taken horizontally backward; it is carried upward and backward, so that it joins the other at an acute angle. We have, then, the portion of lid containing the lashes attached only at its ends, but with its upper margin wedge-shaped. The next step consists in the rotation of this piece so that the edge from which the lashes spring is applied to the upper lip of the skin incision, the lower lip being pushed backward into the wound. This rotation can easily be effected by sutures passed from the lower margin of the detached portion to the upper margin of the skin incision. The sutures are tied and the operation is complete.—James W. Barrelt, M.D., F.R.C.S., in *Ophthalmic Review*, May.

Injections of Gray Oil in the Treatment of Syphilis.—Dr. James Galloway writes in the *Practitioner* that a much greater measure of success has followed the renewed trial of this treatment since an improved technique has been adopted. The preparations made use of are the gray oil and a suspension of calomel, as before; but it has been found advantageous to use vaselin oil in the manufacture of the fluids, in preference to other vehicles. (The gray oil formulæ are mercury, 3; lanolin, 3; olive oil, 4; or, mercury 39; mercurial ointment, 2; vaselin oil, 59. Martindale and Westcott.) But preferably Milliet and Thibierge's formula (*Vide Annal. de Derm. et de Syphil.*, 1894, p. 943, which is itself a modification of that employed by Professor Neisser). Three and a half drops of the gray oil and 1 gram of the calomel oil, containing 0.05 gram of the pure salt, are the doses now used instead of the much larger doses formerly employed. The injections are given weekly over periods of six or eight weeks, or at longer intervals as circumstances direct, and between each course of treatment is a period of repose, according to the rules formulated by Professor Fournier. The fluid is injected deeply into the muscles of the buttock, taking care to avoid the vessels and nerves of this region, and, in order to secure that the injection shall be placed at a sufficient depth, the syringe is armed with a needle of from 5 to 6 centimeters in length. Great care must also be taken to prevent any of the fluid from coming in contact with the skin or subcutaneous tissue of the part. A rigid antisepsis of the fluid, of the apparatus and of the skin is essential. With these precautions, the painful swellings, the abscesses, the severe mercurialism, which formerly gave the treatment "a black eye" are evaded. The advantages claimed for the method are: 1, the certainty and convenience of the treatment, so that, as a rule, the patient's occupation is in no way interfered with. The patient comes once a week for his injection, nothing interferes with his dose, and then he goes about his daily occupation, whether of pleasure or of business. 2. The secrecy which is characteristic of the treatment is much appreciated by patients, and can not be obtained so completely by any other means. 3. Its non-interference with the digestive apparatus and the liver—an important consideration when one recollects the evidence showing that structural alterations are produced not infrequently in the mucous membranes of the stomach and intestine, and in the liver by courses of mercury administered by the mouth. 4. The inability of certain patients to take mercury, owing to the immediate irritation caused in the alimentary tract. 5. Its powerful effect and rapid action when compared with the other methods of administration—a fact of the utmost moment when syphilitic lesions of vital organs have to be treated.

The efficacy of the method has never been in doubt, and now many cases are on record of inveterate syphilis treated and completely cured by these injections, after having resisted all other forms of treatment. We will quote one only, given by M. Thibierge, which has the additional authority of Professor Fournier himself. The patient was a cachectic and chronic syphilitic of eighteen years' standing, and suffered from severe headache associated with the formation of exostoses from the cranial bones. Very little result had been obtained by Fournier with the ordinary methods of treatment, and the patient was sent to Aix-la-Chapelle, where he was subjected to courses of inunction, which had given much pain and inconvenience, but did no good. He then had the good fortune, as Fournier puts it, to consult Thibierge, and was treated by injections of the gray oil; he rapidly lost the headache, and at the same time the exostoses diminished in size, while his health rapidly improved.

As to the relative merits of the gray oil and calomel, it appears that the effect produced by the calomel is more rapid and powerful, while the gray oil acts somewhat more slowly, but causes little or none of the characteristic pain; so that, as Thibierge remarks, in the case of calomel we have a remedy producing its effect *cito*, while the gray oil has the advantage of acting *tuto et jucunde*. The only inconvenience is the pain which seems to be so often the result of the injection. At the actual time of the injection nothing is complained of, but on the third or fourth day a certain amount of pain resembling that caused by a bruise is felt at the spot where the operation has been performed; it reaches its maximum on the fifth or sixth, and subsides by the eighth day. In the majority of cases the pain is not severe, in many it is altogether absent, but in a small proportion it is so acute as to render the method intolerable. Even in the last group of cases the pain does not always occur, and thus it is suggested that the very severe pain is an accidental circumstance, and may in the future be eliminated.

PRACTICAL NOTES.

Cause and Treatment of a Volvulus.—Prioleau states that a frequent cause of volvulus is defecation deferred when the desire is imperious, on account of the conflict between the peristaltic and antiperistaltic movements. Mucous enteritis and sigmoiditis may also produce the same result. The most important diagnostic indications are the absence or tardy appearance of vomiting and a sharp localized pain accompanied by local meteorism. Treatment recommended: Forced injections of 3, 4, or 5 liters, administered with an Esmarch douche, and glycerined water at 100 per cent.; supplemented by puncture of the distended intestine and abdominal massage.—*Bulletin Méd.*, April 26.

Efficacy of Thyroid Treatment for Fibroma of the Uterus.—It was by accident that Jouin discovered the value of this treatment. He had a patient with a voluminous fibroma, and as she was painfully obese he administered thyroid extract to relieve her of her obesity, when he found that the fibroma shrank rapidly to one-quarter of its former size. He reported at the Tunis Congress that he had used it since in twenty-four cases, finding that thyroid medication certainly reduces the fibroid growth, and has also a most favorable effect on the attendant symptoms, local neuralgias, debility and depression, but it is especially valuable for its power to arrest the tendency to hemorrhage. It is very effective in uterine hemorrhages due to the menopause, with or without fibroid growths. He suggested

that as the fibroma is really only a sarcoma in a certain stage, thyroid medication may yet be found useful as a preventive. He suggested also a possible connection between the atrophy of the thyroid gland with increasing adult age, and the atrophy of the genital organs at the menopause, generalizing that lack of function may perhaps be the cause of the tendency of the tissues to return to their original embryonic fibroid state, of which the fibroma is an extreme instance.

Low Temperature Pasteurization of Milk.—Dr. Rowland G. Freeman recommends the Pasteurization at a temperature between 65 and 70 degrees C., for the following reasons: It destroys almost all the ordinary air bacteria which occur in milk. It destroys the bacillus tuberculosis, the bacillus typhosus, the bacillus diphtheria and many other pathogenic bacteria. It causes no change in the taste of the milk and avoids those chemical changes which are produced by higher temperatures.—*Archives of Pedriatrics*, August.

Results from Antidiphtherial Serum at Edinburgh.—In the *Glasgow Medical Journal*, Dr. Ernest L. Marsh publishes a carefully prepared set statistic tables showing the influence of the antitoxin treatment on the cases of diphtheria admitted to the Belvidere Fever Hospital during 1895. The admissions numbered 179, and of these 137 were treated by antidiphtherial serum, the remaining 42 cases were not brought under the treatment, as being mild and not requiring it, or as being moribund on admission. Of the mild cases, the number was 38, and of the moribund there were 4 cases. The fatal cases numbered 25, giving on the admissions a percentage of 14 deaths. In the five years previous to 1895 the cases of diphtheria had never given a less percentage than 35.5 deaths in any one year, so that the improvement is a very impressive one. Of the 179 patients in 1895 tracheotomy was needed in 29, and of these 10 died, giving a mortality of 34.5 per cent. The author draws special attention to these cases and contrasts the low death rate with the high mortality of the tracheotomy cases in previous years, viz., 76.2 per cent. (42 cases) in 1893 and 86.9 per cent. (23 cases) in 1894.

Diphtheritic Laryngeal Stenosis "Cured" with Behring's Serum.—The *Deutsch. Med. Woch.* for July 9 describes a severe case of diphtheritic stenosis in which the parents refused to allow tracheotomy, as they had lost another child previously where it had been performed (non-serum treatment). The physician considered the case hopeless, but still administered a dose of Behring's serum (1,000 immunity units) with the usual local treatment. The case continued growing worse for thirty hours, when a sudden change for the better became apparent, and rapid improvement and recovery ensued. Bornemann adds that if other cases confirm this experience, that serum treatment promptly administered will cure diphtheria in spite of laryngeal stenosis (if it is of short duration and the heart still vigorous), new fame will accrue to its inventor and many children now considered past hope will be saved. All of which, to use use an old phrase, "is important if true."

Tuberculosis of the Lungs in its Incipiency.—The microscope, when it demonstrates the existence of tubercle, confirms the diagnosis of tuberculosis, but its failure to demonstrate their presence does not imply that the disease does not exist, because the germs of consumption appear in the sputum only when the tubercles open and the germs are liberated and this occurs not in the incipiency of the development but in the second, third and fourth stages. Pulmonary tuberculosis may present at first the slightest pigmented catarrhal secretion, which gradually changes to a more yellowish substance, and finally becomes thicker and more profuse. The first discharge may contain no bacilli. This seems to be the result of limited inflammation, provoked by the development of tubercle foci, and not until some of the foci rupture do we find pus in its true nature and germs of consumption. Catarrhal conditions of the lungs then should always be considered suspicious, and only good can result from a treatment based on this ground.—Dr. Paul Paquin in *Medical Herald*, July.

Tic Douloureux.—Dr. Danas's method of treatment consists in the following procedures: 1. Strychnia is given in single daily doses, hypodermically. He usually begins with gr. 1-30, and this is very slowly increased until by the fifteenth or twentieth day gr. 1-6 to 1-4 is given. Most patients can not take over gr. 1-5, an excess being shown by stiffness in jaws and legs, trembling and nervousness. Sometimes the largest doses are not well borne and are not advisable, but this is rare. After receiving the maximum dose it should be continued for a week or ten days and then gradually reduced, so that by the end of five to six weeks the beginning dose is reached. The drug is then stopped and is replaced by others. 2. The patient is now placed on potas. iodid, gr. v, *ter in die* increased to gr. xx; and tincture of iron m. v, increased, if possible, m. xxx, and well diluted. In some cases salicylate of potassium replaces the iodid, or nitroglycerin is added to the iodid or iron. 3. Rest in bed, with light diet and diuretics.—*The Post-Graduate*, July.

Thyroid Medication in Goitre.—Pharm. Institute of Budapest, has been making a special study of this subject. The investigations are described in detail in the *Deutsch. Med. Woch.* for July 9. The results briefly stated are: 1. The goitre in every case decreased in size. 2. The patients lost in weight, some as much as one to two kilograms. 3. The amount of urine increased. 4. The elimination of nitrogen, especially, in the urine, increased. 5. Increased elimination of ClNa and of P_2O_5. 6. The amount of uric acid execreted was much increased, especially in the first days of the treatment. We know that the amount of uric acid excreted increases with increased numbers of leucocytes. The latest researches have established the fact that thyroid medication increases the number of leucocytes, which accounts for the increased amount of uric acid. Until we are better acquainted with the chemic structure of the thyriod gland, it is not sufficient to explain this increase in the amount of uric acid by the assumption that it corresponds to the amount of deterioration of the nuclein bases (xanthin, hypoxanthin) in the thyroid gland. It is interesting to note that Baumann does not consider it settled that the thyroiodin he discovered may not be some product of a nuclein acid.

Operation for Appendicitis.—Dr. A. J. Bloch describes his method of operation, in acute and gangrenous forms, as follows: "An incision four inches long was made in the right linea semilunaris, and the cecum exposed. This was drawn into the abdominal incision and the appendix located. The appendix was detached from the abdominal viscera, to which it was adherent and brought out at the wound, the cavity of the abdomen being shut off with sterilized gauze. With two pairs of long forceps I seized the appendix, placing one pair three-fourths of an inch from the cecum and the other a little nearer the distal end, dividing the appendix between them. Cleansing the surface, two long straight needles threaded with fine silk, were passed, one into the anterior, the other into the posterior lip of the remaining appendix, tied and given to an assistant to hold, the needles and sutures being left in place. The forceps were now removed, a small uterine dilator passed through the lumen of the divided appendix into the cecum, and both dilated to the extent of from one half to three-fourths of an inch. The needles were then both together passed through the dilated lumen of the appendix and cecum, into and out of the cecum at its posterior surface, making but one puncture. Pulling now upon the sutures the appendix became invaginated into the cecum, and healthy tissue approximated, three rows of Lembert sutures were then passed through the cecum, completely closing off the invaginated appendix, the traction sutures

cut and allowed to drop into the bowel, and needle puncture closed by one or two sutures. The abdominal wound was closed with silkworm gut without drainage and sterilized dressings applied.—*New Orleans Med. and Surg. Jour.*, August.

The Technique of Suprapubic Puncture.—In the *Wiener klin. Wochenschrift*, Dr. Von Dittel state that he has tapped the bladder above the pubes considerably more than one hundred times. He washes it out by means of a two-way cannula, and and then introduces a Jacques catheter (No, 8), the caoutchouc of which has the property of swelling up and so effectually preventing any escape of urine. The catheter must be changed at least once in eight days; its stopper is to be removed whenever the necessity for micturition is felt, once at least every four or five hours. When introduced in this way the foreign body seems much less likely to induce vesical catarrh than if inserted *per vias naturales;* this is probably due to the absence of the bacteria of the urethra. The puncture has a great tendency to spontaneous closure, which is a manifest advantage when the indications for its employment have been obviated. Von Dittel has always operated in the mid line, but of late Schopf has conceived the ingenious notion of a lateral puncture, whereby the rectus or pyramidalis is used as sphincter and the permanent catheter done away with. One disadvantage of this method is that the puncture requires keeping open by the nightly passage of a sound or drain. Furthermore, Von Dittel has shown that the depth of the peritoneal pouches inclosed by the urachus, obliterated hypogastric arteries and the epigastric arteries is very variable, so that in some cases but a very small portion of the anterior wall of the bladder is free from peritoneum. In such instances lateral puncture may lead to perforative peritonitis, and of this he records one fatal case. He has therefore abandoned Schopf's procedure, and reverted to his own former method. He has found, however, that the poorness in vessels of the linea alba sometimes leads to necrotic changes round the puncture, and therefore now adopts the plan, particularly in old people, the operating just at the edge of this tendon.

Improper Performance of Caesarean Section.—We are indebted to the *New York Medical Journal* for an analysis of a discussion of the above named operation, that has appeared in the *Centralblatt für Gynäkologie*. It appears that Dr. J. Esser reported a case of that operation, the sole indication of which was an enlarged fetal trunk (the head had been detached by the use of forceps); this distension was later found to be due to the presence of a large quantity of clear fluid in both chest and abdomen. He reported his case in the *Centralblatt* for March 21, defending his employment of Cæsarean section rather than embryotomy. The woman made a good recovery. In the same journal for April 4, however, Dr. F. Ahlfeld criticises Dr. Esser's course very severely. "It may happen, he says, that in the conduct of a case harrowing to both mind and body, in which one resource after another fails, an obstetrician at last loses his head and subjects both mother and child to danger by resorting to a wholly unsuitable procedure, and under the circumstances he may be pardoned, or at least the circumstances may be pleaded in extenuation. But in the whole history of obstetrics it has not been recorded before that a practitioner calling himself 'Frauenarzt, and having a 'Klinik,' presumably, therefore, having served for some time as assistant in a hospital, when called to a well-built woman in labor in the sixth month, has applied and reapplied the forceps, then explored the interior of the uterus up to the fundus on the right and on the left, whereby he has ascertained that the obstacle to delivery lay in abnormal distension of the child's body, and finally sent the woman into his 'Klinik' and performed the Cæsarean operation on her. The climax is capped when Herr Esser has the heart to publish such a case and maintain that his conduct of it was proper. Dr. Ahlfeld goes on to declare that, if Dr. Esser had followed the precepts laid down in the text-books, his course would have been as follows: When an hour or two had elapsed after full dilatation of the os uteri, and the little head, lying deep in the roomy pelvis, failed to advance, he would have suspected at once that the trouble was due to immense distension of the fetal trunk. An examination with four fingers, or at all events with the whole hand, would easily have cleared up the point, and then he would have simply opened the distended trunk with the perforator, after which the child would soon have been expelled without further medical intervention. Dr. Esser has no ground for alleging that his case possessed extraordinary features; on the contrary, that particular cause of dystocia is a typical one, occurs over and over again, and is always to be met in the same way. Ludwig's case, which Esser unjustly adduces, showed real difficulties; the child was gigantic, and a young physician might well have been perplexed as to his choice of resource. But even in this case the Cæsarean operation was unnecessary. Neither case can be regarded as legitimately extending the field of usefulness of the Cæsarean section; on the contrary, each of them should serve as a warning to young physicians."

New Method of Diagnosing Typhoid Fever with Serum from Patient.—Recent investigations by Pfeiffer, Koll and Gruber have shown that the serum of persons convalescing from typhoid fever, the same as the serum of animals immunized against typhoid infection, will produce a distinct and specific reaction when added to a culture of Eberth's bacillus *in vitro*. They found the same phenomena with the cholera spirillum and Escherisch's bacillus. The process is so clearly defined that it promptly differentiates the disease, while it is so simple that it requires nothing but a tube culture of Eberth's bacillus (which keeps for weeks) and a drop of blood to complete it. If a few drops of immunized serum are added to a culture of the coli bacillus they produce a noticeable cloudiness, with decided motility of the microbes. The effect is entirely different if they are added to a tube culture of Eberth's bacillus. There is no cloudiness, but the reverse; the microbes cluster in masses, forming agglomerations and a precipitate at the bottom of the tube, with limpidity instead of cloudiness. This agglutination is the point in differentiating, and the higher the serum is immunized, the more rapid the effect, sometimes occurring as rapidly as a chemic process. Widal announces that he has been testing the serum from patients in various stages of the disease, and has found the reaction unmistakable in each. He drew the blood from the vein in the bend of the elbow, with a syringe, after antiseptic precautions, or from the hand of the patient, hanging over the edge of the bed, after slightly massaging the finger from the root to the point, when a prick with the lancet will draw enough blood (½ to 2 c.c.), which should be caught in a thimble or test tube first passed through a flame. After corking and waiting a few minutes for the serum to separate, add one drop of the serum to ten drops bouillon culture of Eberth's bacillus, and in a very short time the agglomeration commences, if it is a case of typhoid. Between the characteristic agglutinations a few scattered and motile microbes are still to be seen, growing less in number until, in a few hours, they have all been absorbed into the clustered masses. The drop of blood can be drawn directly into the culture, but no time is gained, as the serum has still to separate. Widal also made the test with serum from normal persons and also from numerous patients suffering from different diseases, as well as from persons who had recovered from typhoid fever from one to fourteen years previously. In each of these cases there was none of the specific typhoid reaction, the agglomeration, but the Eberth bacillus kept on the even tenor of its way, isolated and motile.—*Bulletin Médical*, June 28.

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SATURDAY, AUGUST 15, 1896.

THE WICKED HOUSE FLY.

I'll hide my master from the flies as deep as these poor pick-axes can dig.—*Cymbelene.*

At the August season when the summer dog-days are with us, the mighty insect *Diptera*, of the noble family *muscidæ*, particularly the *musca domestica* or the *musca harpya*, commonly mentioned in the vernacular as the house fly, makes his presence seen and felt. From the earliest times, the ancestors of this species were known to be most malicious, and at the same time as a plague most unaccountable.

When the LORD threatened PHARAOH that he would send "swarms of flies upon him," PHARAOH was probably not aware that the mere presence of the fly, insured the planting of plenty of pathogenic microbes, and it is probable that the corruption of the land by reason of the swarm of flies (Psalms cxv. 21), had a great deal to do with the death of the first-born in the plague next succeeding.

"Dead flies cause the ointment of the apothecary to give forth a stinking savor," says the good book (Eccles. x, 1) and it is morally certain that in these bacteriologic days, not only *dead* flies, but flies of all kinds are known to be carriers of contagion.

"The proboscis of the house fly" says one of our popular encyclopedias "is a very interesting object," a remark almost paralleled by that attributed to the late ARTEMUS WARD concerning the kangaroo. "The kangaroo" remarked ARTEMUS reflectively, is an "amoosin cuss." "The proboscis of the fly is the greatly developed 'tonguelet' or lingula, the upper part of the under lip, but with these are combined lancets formed of the metamorphosed maxillæ" (CHAMBERS). Not only may this weapon infect the tiny wound made in the skin, but bacteria themselves develop in the intestinal canal of the insect, and are ejected on every accessible object of food or furniture. This is the well known "fly speck" abhorrent to the good housewife. But the measure of the iniquity of the house fly does not end here. As he has a decided preference for a diet of decaying garbage, putrid sores or rotten carcasses he alights upon them and without stopping to sterilize his feet afterward he flies to madame's kitchen where he dips his feet jauntily into the iced tea, deposits a "speck" or two on cut bread just as it goes to the table, or annoys madame herself by maliciously alighting near the corner of her eye.

It needs no philosopher, no PASTEUR or TYNDALL to show the infinite capability of the fly as a carrier of infection. Bacteriologists have traced the infection carried by flies until there is no longer any question of the fact (see this JOURNAL, June 25, 1892, Vol. xviii, p. 818). LUCIEN HOWE remarked the frequency with which the fly is the most probable source of contagion in the Egyptian ophthalmias. When flies walk over a gelatin culture, bacteria develop in their tracks (see this JOURNAL Sept. 22, 1894, Vol. xxxiii, p. 479). It is proper to say that the constant irritation of the lid produced by fine particles of sand, predisposes to the development of the bacteria when once deposited. The observation of Dr. HOWE, however, is not new, for M. SONNINI, years ago in speaking of Egypt, said: "Of insects there the most troublesome are the flies. Both man and beast are cruelly tormented with them. No idea can be formed of their obstinate rapacity when they wish to fix upon some part of the body. It is in vain to drive them away; they return again in the self-same moment, and their perseverance wears out the most patient spirit. They like to fasten themselves in preference on the corners of the eyes and on the edge of the eyelid. . . . The Egyptians paid a superstitious worship to several sorts of flies and insects. If then such was the superstitious homage of this people, nothing could be more determinate than the judgment brought upon them by Moses. They were punished by the very things they revered, and though they boasted of spells and charms, yet they could not ward off the evil. How intolerable a plague of flies can prove is evident from the fact that whole districts have been laid waste by them. Such was the fate of Myuns in Ionia and of Alarnae. The inhabitants were forced to quit these cities, not being able to stand against the flies and gnats with which they were pestered. TRAJAN was obliged to raise the siege of a city in Arabia, being driven away by the swarms of flies. Hence different peoples had deities whose office it was to

defend them against flies. Among these may be reckoned BAALZEBUB, the fly-god of Ekron, *Hercules Muscarum Abactor*, and hence JUPITER had the titles of *apomnios*, *muigros*, *muiochoros*, because he was supposed to expel flies and especially to clear his temples of these insects." [1]

The Hebrews also had the same superstition as appears from JOSEPHUS, who narrates that "AHAZIAH, as he was coming down from the top of his house, fell down from it, and in his sickness sent to the Fly, which was the god of Ekron, for that was this god's name, to inquire about his recovery." [2] A footnote states that the "God of flies seems to have been so called, as was the like god among the Greeks, from his supposed power over flies in driving them away from the flesh of their sacrifices, which otherwise would have been very troublesome to them." In literature the fly has been execrated from time immemorial. Persons who forced themselves into other men's entertainments were called flies, as a term of reproach, and "in PLAUTUS an entertainment free from unwelcome guests is called *hospitium sine muscis*, an entertainment without flies; and in another place of the same author, an inquisitive and busy man, who pries and insinuates himself into the secrets of others, is termed *musca*. We are likewise informed by HORUS APOLLO that in Egypt a fly was the hieroglyphic of an impudent man, because that insect being beaten away still returns again; on which account it is made by HOMER an emblem of courage." [3]

But the wicked fly notwithstanding his demoniac doings has had his defenders, some from pure benevolence, as Tristram Shandy's Uncle Toby: "So," says he, one day at dinner, to an overgrown one which had buzzed about his nose and tormented him cruelly all dinner-time, and which, after indefinite attempts, he caught at last, as it flew by him, "I'll not hurt thee," says my Uncle Toby, rising from his chair and going across the room with the fly in his hand, "I'll not hurt a hair of thy head; go!" says he, lifting up the sash and opening his hand as he spoke, to let it escape. "Go, poor devil, get thee gone, why should I hurt thee? This world, surely, is wide enough to hold both thee and me." [4]

Another defender was OLDYS, whose two stanzas, according to D'ISRAELI,[5] were occasioned by a fly drinking from a cup of ale, the favorite potion of poor OLDYS:

Busy, curious, thirsty fly!
Drink with me, and drink as I.
Freely welcome to my cup
Couldst thou sip and sip it up;
Make the most of life you may,
Life is short and wears away.

Both alike are mine and thine,
Hastening quick to their decline,
Thine's a summer. Mine no more,
Though repeated to three score!
Three score summers when they're gone
Will appear as shortas one.

But however sweet and delicate the strain of OLDYS, we can not forget that this is not the age of sentiment, and we must therefore insist in the interest of public health and suffering humanity, that the fly must be excluded from our houses by every possible barrier; he must be kept away from our food supplies by every possible means, and if he persist he must be destroyed with no less sternness than is displayed by

Boys pursuing summer butterflies
Or butchers killing flies. CORIOLANUS.

BICYCLING—PRO AND CON.

If every smoothly paved thoroughfare, crowded, especially at night, with men, women and children bestriding a bar suspended between two wheels, were not alone evidence of a *furor populi*, the facts that large establishments exclusively devoted to the supply of bicycles and their numerous appurtenances have sprung into existence in every quarter, that piano stores include among their offerings for sale more varieties of the silent wheel than musical instruments, and that even little narrow "holes in the wall," where thread and needles or candies and newspapers once modestly bid for buyers, now exhibit their half dozen apparatus, betoken a craze that has possessed the people wilder than the magnetic syrup or any other fad of forty years ago or the silver *folie* of to-day.

It is, perhaps, injudiciously soon to cry "halt" to the maddened crowd of riders, and so many physicians, themselves victims, have sanctioned the practice by precept and example, that the criticising medical men, who do not ride, are sought to be discredited because they have not ridden. As for the clerical advocates who have hastened into print with their indorsement of this new sanitary device for developing the muscles and at the same time encouraging innocent diversion at the expense of roof-gardens and rum-shops, MRS. CHARLOTTE SMITH has spiked their guns by suggesting that the grateful recognition of an acceptable gift has unfitted them for unprejudiced judgment.

If medical men and medical journals ought to interest themselves in the every-day affairs of life, there is good reason why they should give most serious consideration to this bicycle question, which has grown to such incredible proportions within so short a time. Its only parallel is the jinriksha of Japan (the two-wheeled buggy with a man between the shafts), which wholly unknown thirty years ago, has now almost completely supplanted all other modes of travel. Inasmuch as no inconsiderable number of the members of the profession themselves bestride the double wheel, the case so far as they are concerned has been prejudged, and it may be assumed that others, whose families and friends have acquired the habit, are in the same category.

Enthusiasts do not kindly brook criticism. If you

[1] Edwards' Encyclopedia of Religious Knowledge, 1852.
[2] Josephus' Antiquities of the Jews. Book IX, Chap. 11.
[3] Potter on the Miscellany Customs of Greece.
[4] Sterne: Tristram Shandy, Vol. II, Chap. 12.
[5] Curiosities of Literature.

have not eaten raw fish with the Japanese or limaçons with the French, you are apt to be challenged with: "What do you know about a diet of uncooked salmon or slimy slugs anyhow?" Admitting the palatability of the dish, it is still possible for the looker-on to argue its wholesomeness. A moment of impartial inquiry, therefore, may be permitted the physician, who is seriously concerned with the welfare of the people among whom he lives.

At the first view, it seems plausible that anything which impels individuals to pass so many hours a day at exercise in the open air should be beneficial, and undoubtedly the abstract statement is incontrovertible. One startling revelation for which the bicycle is responsible is the amazing number of spindle-shanks among the feminine part of the population. Notwithstanding the aid of leather leggins and worsted stockings, the cruel fact is evident to the on-looker that Mary Ann and Eliza Jane, as well as Birdie and Rosie, Maud, Ginevra and plain Susan have unsubstantial understandings that bespeak lack of exercise and poor nutrition, and the pedaling action required to propel the machine ought, *prima facie*, be the indicated means of repairing attenuated calves. It is true that the same amount of exercise afoot would be equally salutary, but the inducements to walk are so much less that the outdoor recreation is not obtained. The mere purpose of improving the health has never been sufficient to impel either young or old to do anything that will accomplish this end, as the admitted fact of downright harmfulness has never deterred even the intelligent, wise and cultured from some gratifying indulgence. The novelty of the bicycle, the delusion that one is sitting down and gliding without personal effort, the element of fashion, the contagiousness of example influence all classes to mount and away, when the suggestion or advice or invitation or command to "put on your hat and take a brisk walk" is resolutely ignored or defiantly opposed.

Granted then, that the congregation of men, women and children in the open air, on broad avenues, upon country roads, in park-ways and by river-banks rather than sitting in crowded, ill-ventilated theaters, saloons, billiard-rooms and beer-gardens is a sanitary gain, shall it be denied that this alone commends the practice? Not—were this the whole truth and nothing but the truth.

Watching the swiftly moving throng on a city boulevard the observer notes the fact that the posture of the majority of male riders involves a curious contortion of the body, by which the head is lowered and the face lifted, thus curving the neck anteriorly, while the back and shoulders are elevated into a hump, the chest and abdomen forming a hollow corresponding to the dorsal convexity. The legs are bent at an acute angle upon the trunk, the whole weight of this being thrown upon that portion of the body which in the normal act of walking is absolutely free from strain and pressure. Medical bicyclists admit that the posture of most wheelmen causes injurious pressure upon the parts around the neck of the bladder, developing irritability of the latter, increased desire to urinate, congestion and hypertrophy of the prostate, narrowing of the canal of the membranous and prostatic urethra, and ultimately atrophy of the testes. The last might not be an unmitigated evil in the conditions of modern civilization. The others are sure to enlarge the clientèle of the genito-urinary specialists of a few years hence. It is fair to say that a minimum only of bicyclists, including, of course, all medical men, sit upright, as upon a horse and are content to amble along with gentle effort. In their case, the ischial tuberosities support the body, provided the saddle is broad and without the anterior horn (pommel), relieving the genital region of the pressure inevitable in the hideous hump-backed caricatures which professional wheelmen and their multitudes of imitators make of themselves.

Great as the physical injury to men, it is small beside that suffered by young women. Surmounted upon the edge of a wedge, their very erect posture forces this wedge up between the tuberosities, the yielding soft parts of the perineum resting upon the narrow rigid fulcrum. The tendency consequently is to diminish the outlet of the plastic pelvis by approximating the ischial extremities instead of spreading them apart as in the normal exercise of walking, when the weight of the body is borne upon the widely separated heads of the femurs. It is a sorry sight to watch the young girl enamoured of her wheel, devoting every hour she can spare to the novel, exhilarating occupation, obtuse to the soreness and pain so many of them experience, bruised and excoriated by the prolonged friction, weary and worn, but with the determination of the ballroom belle who dances when ready to fall from fatigue and blistered feet. There are hygienic seats, in two parts, fitted to receive the tuberosities, but they are not in common use, and the majority bestride the narrow saddle with its prominent anterior horn, which presses into the vulva in resisting the tendency to slide forward, especially in ascents.

The esthetics and morality of bicycling do not come within the professional ken of the physician. A costume and posture which make ninety women in a hundred absurd spectacles, will not long be popular with the thousands and tens of thousands of the fair sex as to-day. Slim legs operating like a steamer's walking-beam, and generous buttocks, whose contour is alarmingly delineated, are not pleasing displays; and we leave to the philanthropic lady who is President of the *Women's Rescue League* to show that the promiscuous commingling of respectable young women on the

same roads with the cocotte class, for whom the wheel has such fascination that all ride who can borrow the money to hire a vehicle, and that the accentuation of the leg as the feature of the girl who has learned to swagger in bloomers or short skirts into crowded public restaurants for the much needed refreshment, can only have a demoralizing effect. It is enough for us to declare that a woman, especially an adolescent girl, can not be suspended on the summit of a wedge without injury to the structures above, and deformation of the pelvis; and that the bruising of the flesh, which some riders unwillingly admit, and the craving for stimulants after a fatiguing ride, ought to restrain the prevailing indiscriminate and intemperate use of the vehicle. If exercise be the object, we commend a pair of sturdy human legs as a motor of unsurpassed fitness for every sanitary purpose. Assuredly, the pedestrian's features will not wear that intently anxious expression, which has already been given the designation of the "bicycle face."

ROENTGEN RAYS IN DIAGNOSIS.

The surgical utility of the ROENTGEN rays is now a well-established fact, and every day adds to the evidence in its favor. Their therapeutic value is, on the other hand, a dubious quantity and, as yet, only a few enthusiasts, mostly outside of the ranks of the regular profession, have seriously expressed their faith in it. Experiments conducted under scientific conditions have so far led at best to only unsatisfactory results.

There is, however, in the latest developments of skiagraphy more or less suggestiveness of possible extra-surgical uses of these rays, and it does not seem altogether unreasonable to look forward to their future employment in medical as well as in surgical diagnosis. The methods have already improved to such an extent that it appears even probable that before long we may be able to detect diseased conditions in the viscera by the fluoroscope and thus throw a light also on various pathologic questions. There is a whole field of research in determining the permeability of the various organic and inorganic compounds in these rays, which has thus far only just been touched upon, here and there, in medical literature, notwithstanding its suggestiveness from a medical point of view.

In the latest issue received in this country of the *Deutsche medicinische Wochenschrift*, that of July 23, there is an important paper by Dr. E. SEHRWALD of Freiburg i. B., on the action of the halogens, chlorin, bromin and iodin, on the ROENTGEN rays. He finds them in a pure state to give an almost complete shadow, and in chemic combination producing a shadow proportional to the percentage of the element contained. Solutions and compounds that are almost or absolutely transparent, like hydrochloric acid and bromoform and chloroform, show this peculiarity very plainly, as they give a shadow as dense as that of the metals. The transparency to these rays of organic substances generally is due to the fact that the four chief component elements, carbon, hydrogen, oxygen and nitrogen, present to them very little, if any, obstruction. The shadows that are cast in a skiagraph by the soft parts of the organism are due to the proportion of iron in the blood and the alkalin metals, but especially to the chlorin contained in the tissues.

Such facts as these and others that will undoubtedly be developed along these lines, will suggestively supplement our existing data in regard to the physiologic and pathologic chemistry of the animal tissues. Their practical value will, of course, remain to be determined by future investigations.

A REGRETTABLE OVERSIGHT.

National medical associations are becoming so numerous that it requires considerable watchfulness to avoid conflict of their several dates of meeting. This has led bodies like the American Academy of Medicine, the Medical College Association, the Association of Medical Examining and Licensing Boards and others, to assemble coincidently with the AMERICAN MEDICAL ASSOCIATION, that as many as possible might be able to attend two or more. The circular issued on July 20 by the Secretary of the Mississippi Valley Medical Association, announcing the change of date of the annual meeting of that body from October 20–23 to September 15–18, is in probably unintentional, but very regrettable, conflict with the date of the next meeting of the American Public Health Association, which long ago announced its forthcoming annual session at Buffalo, N. Y., on these very days. While the latter is not technically a medical body, since any one who is interested in public sanitation may belong to it, its membership is so largely composed of prominent medical men, that it has a quasi-professional character, and the enthusiastic devotion of its members to their work, which has made it the leading sanitary body in the world, is so great that its claims to consideration can not justly be ignored.

While it will be difficult for such as are earnest members of both organizations to decide which to sacrifice, a very little forethought would have obviated any necessity for it. Giving the right of priority to the American Public Health Association, not only on account of its longer existence and greater membership, but because of its antecedent selection of the date, considerations which have operated in the case of the AMERICAN MEDICAL ASSOCIATION and its attendant correlated bodies, the Mississippi Valley Medical Association might readily select the week following the adjournment of the older and larger organization, for its own re-amended date of meeting and we earnestly hope that the president, Dr. H. O. WALKER of Detroit,

in deference to the wishes and convenience of those who belong to both bodies, may authorize this change.

THE BRITISH MEDICAL ASSOCIATION.

The very complete abstract of the annual meeting of the British Medical Association, which we have received from our special correspondent, is too voluminous to publish entire this week. We are sure that our members will be pleased to know that the JOURNAL representative received great courtesy at the hands of Mr. ERNEST HART, the editor of the *British Medical Journal*, and every facility was afforded our correspondent for the accurate abstract of the papers read at the meeting, which we shall present in this and succeeding issues. It will be noticed that the next meeting will be held in Montreal.

CORRESPONDENCE.

The Michigan Medical Legislation League.

DETROIT, MICH., Aug. 10, 1896.

To the Editor:—I hope you will permit me to occupy a little more space in the JOURNAL for a few remarks concerning the Michigan Medical Legislation League. Of course, there is no use of continuing a controversy upon a subject when the participants are so widely apart in their premises; but I can not see wherein the "Regular" members of the League merit any censure! On the contrary, they deserve commendation for their patriotism and liberality of spirit in putting aside, for the moment, special ethical scruples for a broader code of human ethics which embraces the welfare, not only of the craft, but of all their fellow human beings. As already pointed out, the Michigan Medical Legislation League is merely a *political* organization. This controversy illustrates curiously the romance of history. Twenty years ago Dr. Donald Maclean and his colleagues of the Faculty of the Medical Department of Michigan University were arraigned before the State Medical Society and, later, before the AMERICAN MEDICAL ASSOCIATION, for associating with, and assisting in the teaching of, the "*despised*" "homeopath." At that time, I am ashamed to say, I was one of the multitude who shouted at them epithets of derision. They were accused, as this League is now by Dr. Maclean, of degrading our noble profession, assisting in the prostitution of medical science, bringing the quack and the fraud (for as such homeopathists were then denounced) *up to the level* of honorable recognition with scientific medicine. They were called feeble, cowardly, treacherous! Such was our bigotry, then, that even the eloquence of Maclean, Frothingham and Dunster could not broaden our narrow disposition, and we persisted in persecuting the Ann Arbor Faculty with a spirit of intolerance for some time. Their position, however, in the light of a broader intelligence, was right! although we were honest in allowing our action to be governed by a belief born of tradition, instead of reason and benevolence. I am sorry that one of those defenders of righteous expediency and equity, has changed so that to-day he is attacking the principles which he formerly assisted to defend! It is a pity that Dr. Maclean did not bring his objections forward at the meeting which adopted the constitution, and formally organized "The League." He was present at that meeting and took an active part in its proceedings, and if he had thus voiced his sentiments, the regular profession might have been spared the appearance (so ludicrous in the eyes of the laity) of dissension and lack of public spirit on matters of public interest. Personally, I would be glad to turn over the "glory" of my office as President of the League to Dr. Maclean, for I do not enjoy the unpleasant duties of official life, while he unquestionably does. However, I feel that the League is engaged in a highly beneficent undertaking, and hope that its members, one and all, may display a courage and fortitude in the coming battle for humanity, which may equal in glory and results the magnificent campaign against bigotry and intolerance which the Ann Arbor Faculty of 1876 achieved.

Regarding my statement pertaining to the composition of the Executive Committee of the League, I should have explained, had I not supposed that Dr. Maclean was aware of the fact, that the Executive Committee included the officers of the League.

E. L. SHURLY, M.D.

Congress of Leprologists.

NEW YORK, Aug. 4, 1896.

To the Editor:—It has seemed desirable to publish all over the world the fact that the government of Norway will next year probably convoke a congress of leprologists, and delegates from all civilized countries, especially from those which, by the suffering of their own people, are especially interested in the question of leprosy. Hansen, the discoverer of the bacillus, suggested that this congress should be held at Bergen, Norway, and out of compliment to him we suppose that there will be no opposition to this proposition. Dr. Goldschmidt, a Paris physician who has practiced among lepers during twenty-six years in Madeira, has originated the scheme. You will find inclosed my correspondence with this eminent leprologist which I hereby authorize you to publish. The American, Mexican, Japanese and Chinese governments, also all the Republics of South America, who are evidently and considerably interested in the question of the suppression and prevention of leprosy, have been appealed to, to join their efforts in this philanthropic undertaking. Norway and Hawaii have already expressed their willingness to send their delegates. The American, English and French governments will assuredly support the movement. The delegates of the different governments will form an international committee, to be permanently active. Funds will be raised by that committee in all civilized countries, and applied to the support of leper asylums in those countries where either the willingness or the capacity to help those institutions is wanting or insufficient. All problems concerning leprosy will be submitted to that international committee.

It is hoped that by this common and universal effort against the dreadful scourge it may, in a comparatively short time, be wiped off from the surface of the world. It is certainly worth the while to fight some years for such a tremendous result. Mankind certainly at no time of history has fought for a greater object. Such a momentous matter can not help to appeal to the sympathies of so important a medical journal as yours, published in a country which suffers more than even China from the terror, against which we mean to begin this fight.

May we hope that you will use the influence of your paper to obtain an expression of opinion from the principal leprologists of India as to this matter. Should some of them, as we fervently hope, be willing to join our congress, will you ask them to communicate their intentions to me, as now and for a little time to come I shall have the foreign correspondence on my hands.

Yours respectfully,

ALBERT S. ASHMEAD, M.D.

A Crusade of Education.

BURLINGTON, IOWA, Aug 10, 1896.

To the Editor:—The controversy now going on in the JOURNAL between Dr. Maclean and the Michigan Medical Legisla-

tive League reminds some of us of the struggle some years ago to get a medical law in Iowa; and some of us perhaps sympathize with Dr. Maclean even if we have such a law and the Regulars have a majority on the Board.

Specialists in general, and eye and ear men in particular, have not infrequently been accused of tendencies to lax methods in practice; and the specific charge commonly made is that of consulting or desiring to consult with homeopaths, etc. Some of our brethren in New York (and they are not all specialists), on account of their liberal declaration on this subject have been denied fellowship in the AMERICAN MEDICAL ASSOCIATION.

But here in Iowa (and it may have been so in other States) we had the spectacle of a "*joint* legislative committee," composed of committees from the regular, homeopathic and eclectic State Medical Societies, who consulted together, moved unitedly upon our legislature, and secured the law we now have.

To some of us I fear that the consultation with a homeopath or eclectic for the welfare of the individual, and a consultation with the same for the welfare of the State, is a distinction without a difference; and we must be pardoned for holding to the belief that the end no more justifies the means in one case than in the other.

No wonder that, under these circumstances the public disregards our denials that medical legislation is intended to benefit the profession more than the public. The public only sees what it esteems *factions*, always warring against each other on everything else, but all in harmony on just this one point; and the conclusion is inevitable. So what sort of a law on the average, do we get? Is it really worth the time and labor spent upon it by the profession?

The Iowa law does not prevent quackery in Iowa. It makes a great show, but the quack who is not ingenious enough to dodge its provisions is too dull to be dangerous; and the dangerous fellows continue to dodge it successfully—as the records will show.

It may be considered rank heresy to entertain such a thought, but after as complete a survey of the situation as I am capable of making, the question arises—is *law* a proper remedy in the physicians' armamentarium? In other words, would it not be better to wait until public sentiment crystallizes into a demand for a medical practice law, the profession confining itself meanwhile to a *crusade of education* in this direction? Let no physician degrade his time honored title by appearing as a lobbyist.

Truly yours, H. B. Young, M.D.

PUBLIC HEALTH.

Examination of Milk Cows.—Secretary Briggs of the Scranton (Pa.) Board of Health has sent out a circular to wholesale milk dealers requesting them to have their cattle examined for tuberculosis.

Epidemic of Sore Eyes Among Boys at Newark, N. J.—A number of physicians have complained that sore eyes were epidemic among the small boys who bathe at one of the public baths, and it was thought the contamination was carried through the water. A number of the cases have been reported to the board of health by the physicians connected with the eye and ear department of St. Michael's Hospital. Measures for disinfection were taken.

New Jersey Law as to Bread and Bakeries.—Chapter 178 of New Jersey Laws, session of 1896, is an act to regulate the sale of bread, which will take effect Aug. 1, 1896. It provides that bread shall be sold by weight, and that all bread sold shall be free from all impure or foreign substances or any material injurious to health. Chapter 181 is to regulate the manufacture of flour and meal food products. It provides how biscuit, bread or cake bakeries shall be drained, plumbed and ventilated; how rooms for manufacture are to be constructed and what to contain; how flour is to be kept; that there shall be washrooms, and that closets and sleeping places shall be kept separate from the work and storage rooms.

To Prevent Illegal Practice in New York City.—At the request of the New York County Medical Society, Chief of Police Conlin ordered every policeman to take the census of the physicians—not including surgeons—found on his post July 29. The Medical Society has inaugurated a war upon bogus doctors, and the enumeration of the medical men is the first step tending toward a vigorous ousting out of practice of all who are not regularly and legally entitled to recognition.

A Sanitary Examination in England.—Some questions and queer answers are reported as having lately been exchanged at a test-examination lately held in England for itinerary inspectors. A question having been asked about the wilful exposure of a person suffering from an infectious disease, the examinee promptly answered: "He must not ride in any conveyance except a hearse without first informing the driver," while another answered: "A person dying of an infectious disease must give notice to the local authority within twenty-four hours." Another candidate said: "Members of a family where small-pox has broken out must be sent to the hospital and well boiled;" while still another said that milk is the best food for children, because it does not require any chewing; and his notion that food builds up the "waist" of the body would seem an error in spelling rather than in idea.

Consumption and Typhoid Fever.—Prof. V. C. Vaughan lectured to the summer school students at Ann Arbor, Mich., July 28. He talked for the most part on typhoid fever and consumption. Dr. Vaughan ventured the assertion that one out of every seven of those present would die of consumption, that 3,000 die of it every year in Michigan, and that 50,000 people annually die of typhoid fever. Both diseases, he said, were easily prevented. He claims that the medical profession of to-day is fully a century ahead of the politicians and others who are in control over municipalities. In Berlin and Hamburg people are compelled to disinfect their sputa, thus retarding the spread of tuberculosis. The death rate in those cities has decreased rapidly. He believes that in time cities will be held responsible for typhoid fever outbreaks as much as they are for defective sidewalks. To prevent typhoid fever, he says, boil your water. To prevent consumption use a cheap paper cuspidor and burn it twice a day.

Danger of Leprosy from Russian Immigrants.—According to reports from Germany the commissioners of immigration and quarantine physicians of this country should be especially vigilant in the examination of Russians who come to the United States. The famous Berlin physician, Prof. von Bergmann, who was recently consulted by the officials of the German health department, declares that a large number of the Russians who enter Germany with the intention of proceeding to America are afflicted with leprosy. The increase of the loathsome malady in the western provinces of Russia has become so alarming that the German government has ordered the immediate establishment of lazarettos at various points along the Russian frontier.

New Jersey Backs Up Health Codes as to Sewers.—A law was passed in New Jersey in May, 1896, providing that in all cities, townships and other municipalities of that State, wherein there are now or hereafter may be sewers constructed for the purpose of carrying off the sewage of such cities, towns, townships and other municipalities, or in streets or sections of such cities, towns, townships and other municipalities, the owners of property along the line of any such sewers shall be compelled to connect their houses and other buildings therewith, in compliance with the ordinances, rules and regulations of any local

board of health now or hereafter to be made for that purpose. The provisions of this act shall be enforced by the local boards of health, by a fine of $25 against any delinquent who shall not comply with the terms of any such ordinance, by-law or regulation within thirty days after notification to make the prescribed connection or connections by the proper officer of the local boards of health, and an additional fine of $10 for each and every day after such thirty days in which the provisions of this act and of such notice shall not be complied with.

New Departures in the Massachusetts State Board of Health in Diphtheria and Tuberculosis.—The State Board of Health of Massachusetts has recently issued circulars stating that it is prepared to examine cultures taken from the throat for the bacilli of diphtheria, sending out the necessary tubes and swabs, and reporting to the physicians or local boards of health who may send cultures for examination. The circulars explain in detail the proper methods of taking cultures, and explain their value both in the diagnosis of doubtful cases and in determining the length of time the isolation of convalescent cases shall be continued. This circular is accompanied by another which explains in detail the methods of administering the antitoxin furnished by the State Board of Health, and of caring for the syringe, etc. The Board also offers to make examinations of sputum for tubercle bacilli, the object being, as stated in their circular, not so much to enable the physician to make an early diagnosis as to protect the public from manifestly infective sputum. Examinations of cover-glass preparations of blood for the malarial organism will also be made by the Board. The opportunities offered by the Board to physicians and local boards of health for having such examinations made without charge can not fail to be of great value to the promotion of public health by the prevention of infectious diseases, especially in our smaller communities, where absolutely no facilities for having this work done have existed. The State Board of Health furnishes an example well worthy of imitation by other boards in Massachusetts et al., or elsewhere, in the thoroughness and efficiency which they have shown in making available to all who may need them, the best modern scientific methods in the diagnosis, prevention and cure of infectious disease.

Havoc by Measles in London.—The *London Lancet* for July 18 sounds the alarm regarding measles as a form of child murder. It says that the mortality for measles has proportions that call for more attention from sanitary authorities than it receives. There is this most significant difference between this mortality in different classes of the community; in the better sort of practice the mortality from measles is almost *nil*. "Some practitioners with well-to-do patients have possibly never seen a fatal case of measles in their practice, though the disease is often highly pyrexial. But the number of deaths from it now in the large towns of England and Wales and of Scotland exceed greatly the number from scarlet fever or diphtheria, or from both of these put together. This mortality has been described lately by writers in the nineteenth century as a form of murder. It is sufficiently illustrated in our issue of last week. Our monthly analysis of London sickness and mortality gives a mortality in June from scarlet fever of 67 and from diphtheria 173, and from both of 240, whereas the mortality from measles was 412. In thirty-three of the largest English towns during the week ending July 4, of 720 deaths due to the principal zymotic diseases, 175 were from measles and 100 from scarlet fever (36) and diphtheria (64) combined. The case of Scotland is not much better. Of 548 deaths in eight Scotch towns, 109 were caused by the principal zymotic diseases; of these, 38 were referred to measles. Glasgow—whose physicians, notably Dr. Gairdner and Dr. Russell, have directed attention to this infanticidal disease—has a bad preëminence in this respect, and measles is resposible for 33 of the 38 zymotic deaths." Such havoc of infant life can not be much longer continued without scandal and discredit to sanitary authorities. The remedy is not so easy as in the case of the other two diseases, as the infectiousness is greater and has time to act before quite declaring itself. Nevertheless, ways must be found for improving the hygienic environment of the little patients and for anticipating the diagnosis under suspicious circumstances.

New Regulations in New York City Concerning Garbage Collection.—After August 1, the householders of that city will be obliged, under penalty of a fine of $50, to observe the new regulations of the health department directing the separation of kitchen garbage. They can not allege, however, that they have not had timely notice, for on June 23 the Mayor issued a proclamation and the health department sent out these notices: Please take notice that section 95 of the sanitary code, which requires that a suitable and sufficient receptacle be provided on every premises for receiving and holding garbage without leakage, and that a separate receptacle, made of or lined with some suitable metal, shall be provided for ashes, and that ashes and garbage shall not be placed and kept in the same receptacle, will be enforced by the board of health on and after Aug. 1, 1896. The department of street cleaning will collect ashes and garbage in separate carts on and after Aug. 1, 1896, at each house. It has also been decided that householders shall provide a third receptacle for refuse of such a character as would come under the head of broken furniture, bottles, rags, old shoes, clothing, etc. The street cleaning department is not obliged to remove articles of that description from houses, as they do not properly come under the head of garbage, but it does so as a matter of convenience to the householder, and also with a view to the preservation of the public health. The third receptacle may be a basket, box or a similar article. The occupants of flat houses may in some cases seek to avoid complying with the order. In such cases the owner of the building will be held responsible. The police department has been instructed to coöperate with the health and street cleaning departments to secure a thorough enforcement of the law. Twenty-two policemen were detailed by Acting Chief Cortright to assist in the work. Only one collection of garbage will be made daily, and that in the forenoon. The city has entered into a contract with the New York Sanitary Utilization Company, which has established a large plant at Barren Island for the purpose of disposing of garbage. All garbage except ashes will be taken charge of by the company after it has been delivered by the street cleaning department at the dump. The city is considering the advisability of entering into a contract with a contractor who is willing to buy the ashes and use them for filling purposes.

Health Report.—The following reports of mortality from smallpox, yellow fever and cholera have been received in the office of the Supervising Surgeon-General U. S. Marine-Hospital Service:

SMALLPOX—UNITED STATES.

Ohio: Dayton, July 1 to 31, 1 death.
Louisiana: New Orleans, July 25 to August 1, 4 cases, 1 death.
Florida: Key West, August 3, 3 cases, 1 death.
Tennessee: July 1 to 31, Tipton County, 8 cases; Shelby County, 5 cases, 2 deaths.

SMALLPOX—FOREIGN.

St. Petersburg, July 11 to 18, 2 cases, 6 deaths
Gibraltar, July 12 to 19, 1 case.
Licata, July 11 to 18, 2 deaths.
Königsberg, July 18 to 25, 1 case.
Osaka and Hiogo, June 28 to July 4, 45 cases, 12 deaths.
Kanagawa, July 3 to 10, 3 cases.
Madras, July 18 to 25, 1 death.
Odessa, July 11 to 18, 13 cases, 1 death.
Calcutta, June 20 to 27, 3 deaths.
London, July 18 to 25, 37 cases.
Cairo, May 28 to June 3, 7 deaths.

Alexandria, May 28 to June 3, 4 deaths.
Warsaw, July 11 to 18, 4 deaths.
Bologna, July 18 to 25, 2 cases.

CHOLERA.

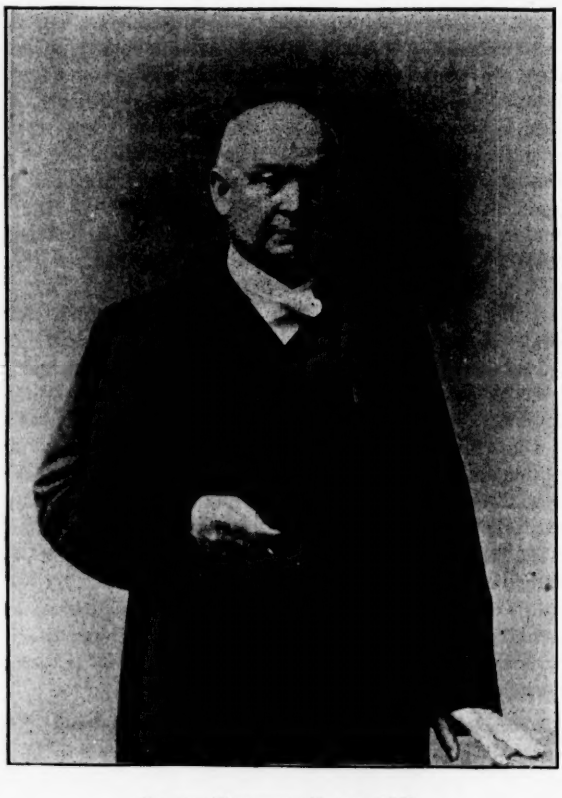
India: Calcutta, June 10 to 27, 38 deaths.
Egypt: Cairo, May 28 to June 3, 175 deaths; Alexandria, May 28 to June 3, 54 deaths.
Japan: July 2 to 11, Tokio Tu, 12 cases, 1 death; Cheba Ken, 1 case; Tuknoka Ken, 8 cases; Hiogo Ken, 2 cases; Iboraki Ken, 2 cases, 1 death; Kagawa Ken, 1 case; Kanagawa Ken, 2 cases; Migayaki Ken, 1 case, 1 death; Okayama Ken, 3 cases; Shidsuoka Ken, 1 case, 1 death; Tochigi Ken, 1 case; Tamanashi Ken, 2 cases; Jehime Ken, 1 case.

YELLOW FEVER.

Vera Cruz, July 23 to 30, 3 cases.
Matanzas, July 22 to 29, 35 deaths.
Santiago, July 25 to August 1, 21 deaths.
Havana, July 23 to 30, 90 cases, 40 deaths.

NECROLOGY.

DR. JOSEPH MEREDITH TONER, of Washington, D. C., died at Cresson Springs, Pa., August 1. He had practiced medicine in that city over forty years, and his death will be keenly felt in medical and scientific circles. He took an active interest in all public-spirited and charitable institutions and societies for scientific investigation. In 1871 he founded the Toner Lectures by placing the sum of $3,000 in the hands of trustees charged with the duty of securing two lectures annually on some original research. The interest of the fund with the exception of 10 per cent., is paid to the authors of the lectures. The balance is added to the regular fund which has thus been increased to $5,000. In 1875, and for three subsequent years, he offered the Toner medal at Jefferson Medical College for the best thesis on the results of original investigation. In 1882 he gave his library, consisting of 28,000 books and 18,000 pamphlets, to the Congressional Library and this collection is kept separate from the other books. This collection is specially rich in American medical writings prior to 1800. Dr. Toner possessed a large collection of the writings of Washington, which is also deposited in the Congressional Library and will be of great historic value. He was born in Pittsburg, April 30, 1825, and received his academic education at the Western University and the Mount St. Mary's College. His medical studies were pursued at the Vermont Academy of Medicine and at the Jefferson Medical College, from which he was graduated in 1853. He practiced in Summit and Pittsburg, Pa., and Harper's Ferry, Va., and established himself in the city of Washington in 1855. He was president of the AMERICAN MEDICAL ASSOCIATION in 1853, and was subsequently a member of the Board of Trustees. He was a member of the Medical Association and Medical Society of the District of Columbia, and at various times filled leading offices in both organizations; of the American Public Health Association; a delegate to, and one of the vice-presidents of the International Medical Congress at Philadelphia in 1876; an honorary member of the New York and California State Medical Societies, of the Boston Gynecological Society. He was the founder of the "Rocky Mountain Medical Society," an organization composed of members of the AMERICAN MEDICAL ASSOCIATION that attended the meeting at San Francisco, in 1871. Among his many writings may be mentioned: "Abortion in a Medical and Moral Aspect," in 1861; "Arrest of Development of the Cranial Bones; Epilepsy," in 1861; "Maternal Instinct or Love," 1864; "Propriety and Necessity on Compelling Vaccination," 1865; "Anniversary Oration before the Medical Society of the District of Columbia," 1866; "The Portability of Cholera and Necessity of Quarantine," 1866, joint paper with Charles A. Lee, M.D.; "History of Inoculation in Massachusetts," 1867; "Medical Register of the District of Columbia," 1867; "Address at the Dedication of Medical Hall, Washington," 1869; "Statistics of Representation in the AMERICAN MEDICAL ASSOCIATION," 1870; "Necrology of the Physicians of the Late War," 1870; Prepared "Medical Register of the United States," 1871; "Sketch of the Life of Dr. Charles A. Lee," 1872; "Statistics of the Board of Health in the United States," 1873; "Free Parks or Camping Grounds, or Sanitariums for Sick Children of the Poor in Cities," 1873; "Facts of Vital Statistics in the United States, with Diagrams," 1872; "Statistic Sketch of the Medical Profession of the United States," 1873; "Statistics of the Medical Associations and Hospitals of the United States, 1873; "Address as President before the AMERICAN MEDICAL ASSOCIATION," 1874; "Dictionary of Elevations and Climatic Register," 1874; "Annals of Medical Progress and Education in America," 1874; "Contributions to the Study of Yellow Fever in the United States: Its Distribution, with Weather Maps," 1874; "Annual Oration before the Medical and Chirurgical Faculty of Maryland," 1875; "Biographic Sketch of Dr. John D. Jackson," 1876; "Medical Men of the Revolution; an Address before the Alumni of Jefferson Medical College," 1876; "Sketch of the Life of Dr. T. M. Logan," 1876; "Biography of Dr. John Morgan of Philadelphia," 1876; "Address on Biography before the International Medical Congress," 1876; "Water Supply of Cities; Public Health Association," 1876; "Notes on the Burning of Theaters and Public Halls," 1876; etc. During his whole life he was one of the most industrious members of the profession, and as he always verified every quotation, he liked to be known as the "fact hunter." His card indexes were prepared mostly by himself. Socially, Dr. Toner was more prominent than any other member of his profession in Washington, and his influence in shaping scientific and medico-political matters at the capital was very great. His handsome, genial countenance will be greatly missed, and he will have no more sincere mourners than those of his colleagues who have met him at the annual meetings for over a third of a century, and who will remember his fraternal hand grasp and his kindly smile with deep regret at the loss of a faithful friend and colleague.



JOSEPH MEREDITH TONER, M.D.

WILLIAM MORRIS HOLT, M.D., of Anchorage, Ky., died at

the St. Joseph Infirmary, Louisville, Ky., of appendicitis, on the 4th inst. He was operated on the day before he died, but the abscess was general and the operation was too late. Dr. Holt was born fifty-six years ago in Henderson, Ky., and graduated at the Louisville Medical College, beginning practice soon after at Lebanon, Ky., where he remained until about fifteen years ago, when he removed to Anchorage where he enjoyed a large and lucrative practice up to the time of his death. He was of a kind and jovial disposition and his death is a great loss, not only to the profession, but to the community in which he lived.

LAWRENCE C. CORTELYOU, M.D. (Bellevue Hospital Medical College, New York City, 1864) at New York, August 5, aged 50 years.

SOCIETY NEWS.

American Public Health Association.—The Twenty-fourth Annual Meeting of the American Public Health Association will be held at Buffalo, N. Y., Sept, 15–18, 1896. The Executive Committee have selected the following topics for consideration: "The Pollution of Water-Supplies;" "The Disposal of Garbage and Refuse;" "Animal Diseases and Animal Food;" "The Nomenclature of Diseases and Forms of Statistics;" "Protective Inoculations in Infectious Diseases;" "National Health Legislation;" "The Cause and Prevention of Diphtheria;" Causes and Prevention of Infant Mortality;" "Car Sanitation;" "The Prevention of the Spread of Yellow Fever;" "Steamship and Steamboat Sanitation;" "The Transportation and Disposal of the Dead;" "The Use of Alcoholic Drinks from a Sanitary Standpoint;" "The Centennial of Vaccination;" "The Relation of Forestry to Public Health;" "Transportation of Diseased Tissues by Mail;" "River Conservancy Boards of Supervision." Upon all the above subjects special committees have been appointed. Papers will be received upon other sanitary and hygienic subjects.

Officers, 1895–96:—President, Dr. Eduardo Licéaga, Mexico, Mex.; first vice-president, Lieut.-Col. Alfred A. Woodhull, Medical Dept., U. S. A., Denver, Col.; second vice-president, Dr. Henry Sewall, Denver, Col.; secretary, Dr. Irving A. Watson, Concord, N. H.; treasurer, Dr. Henry D. Holton, Brattleboro, Vt.

The Canadian Medical Association.—This Association will hold its twenty-ninth annual meeting at Montreal, Aug. 26-28, 1896. The following papers will be read; "Hemorrhagic Pancreatitis," A. McPhedran, Toronto; Title to be announced, Wm. Osler, Baltimore; "100 cases of Retroversion of the Uterus, treated by Ventro-fixation and Alexander's Operation. with subsequent results," A. Lapthorn Smith, Montreal; "The Influence of Mitral Lesions on the Existence of Pulmonary Tuberculosis," J. E. Graham, Toronto; "A Note on Amputation at the Hip Joint in Tubercular Disease," A. Primrose, Toronto; "Tetanus following Scarlatina," J. B. McConnell, Montreal; "Etiology and Treatment of Acne Vulgaris," A. R. Robinson, New York; "The Foot, its Architecture and Clothing," B. E. McKenzie, Toronto; "Ophthalmia Neonatorum," R. Ferguson, London; "Observations on the Relation between Leuchemia and Pseudo-leuchemia," C. F. Martin, G. H. Matthewson, Montreal; "Thyroidectomy," D. Marcil, St. Eustace, Q.; "Some Observations on the Heredity of Carcinoma," T. T. S. Harrison, Selkirk; "Some Applications of Entomology in Legal Medicine," Wyatt Johnston, George Villeneuve, Montreal; "Physiologic Demonstrations of Interest to Medical Men," Wesley Mills, Montreal; "The Theory of the Eliminative Treatment of Typhoid Fever," W. B. Thistle, Toronto; "Oral Surgery," G. Lenox Curtis, New York; "Vaginal Fixation of the round Ligaments for Backward Displacements of the Uterus," Hiram N. Tineberg, New York; "Clergyman's Sore Throat (?)," J. Price-Brown, Toronto; "Non-malignant Tumors of the Tonsil, with report of a case," H. D. Hamilton, Montreal; "Sinus Thrombosis, associated with acute Suppurative Otitis Media, occurring during Scarlet Fever," J. W. Sterling, Montreal; "(a) Exhibition of an Artificial Nose-bridge, (b) Some cases of Foreign Bodies in the Eye, in which the Electro-magnet was used successfully," F. Buller, Montreal; "Remarks on Cold Air in the Treatment of Pulmonary Tuberculosis," Edward Playter, Ottawa; "Hereditary Cerebellar Ataxia (with patient), D. Campbell Myers, Toronto; "A report of three cases of Abdominal Section for Conditions Comparatively Rare," H. Meek, London; "Early Atrophy of Muscles in Cerebral Disease," Frederick G. Finley, Montreal; Title to be announced, F. J. Shepherd, Montreal; "Electric Baths and Dyspepsia," A. L. de Martigny, Montreal; Title to be announced, J. C. Webster, Edinburgh; "Militia Medical Reorganization," W. Tobin, Halifax;

MISCELLANY.

Name of South Carolina Asylum Changed.—The South Carolina institution formerly known as the "State Lunatic Asylum" has had its name changed by law to the more euphonious one of "State Hospital for the Insane."

Appropriation for Vaccin and Antitoxin.—The Chicago city council has appropriated $25,000 for the purchase of vaccin, antitoxin and the employment of physicians to prevent the spread of smallpox and diphtheria.

Date of Meeting of South Carolina Examiners.—The general assembly of South Carolina has changed the date of the regular meeting of the State board of medical examiners, at Columbia, S. C., from the fourth Tuesday in April to the third Tuesday in May, each year.

Medical Heroes.—A hall has been established in the Val de Grace Hospital in Paris, where the names of French medical men who died in the performance of their duty are inscribed on marble tablets. A list of 143 practitioners has just been placed on its walls, all of whom perished in the yellow fever epidemic in San Domingo, 1801-1803.

The Old "Faculte de Medecine."—This structure has been bought by the city of Paris as a historic monument. There is great rejoicing in medical circles that the municipality has purchased this superb specimen of fifteenth and eighteenth century architecture, around which cluster so many memories, as the "cradle of medicine." It will probably be devoted to a scientific museum.

Age of Consent Advanced in South Carolina.—Section 2460 of the general statutes of South Carolina of 1882, defining the crime of having carnal knowledge of a woman child has been amended by changing the age from ten to fourteen years, and providing that where the woman or child is over ten years of age the jury may recommend mercy and the penalty shall be reduced to imprisonment for a term not exceeding fourteen years.

Fees for Examinations for Life Insurance.—The Equitable Life Insurance Company of New York has issued the following circular to medical examiners: "Please take notice that for medical examinations for new insurance in this society made in the United States, the Canadian provinces and Newfoundland on and after July 1, 1896, compensation will be by the uniform fee of $5 for each case of a completed examination report and opinion of the risk, rendered according to the society's standard blank form for a medical examination report. The cost of an examination for the restoration of a lapsed policy is to be borne by the subject, and not by the society. The fee in such cases is accordingly a matter of private arrangement between the examiner and the examinee."—*Med. Exam.*, July.

Vacancies in South Carolina Boards of Health.—The South Carolina statute approved Jan. 5, 1895, entitled "An act to establish local boards of health in the cities and incorporated towns of the State and to define the powers thereof," has been amended, by act of 1896, providing that in all cases of vacancies on said board occurring from any cause at any time, said

vacancies shall be filled by appointment for the unexpired term or terms. The city as well as town council is also now expressly authorized to impose or collect the $25 fine provided for failure of any member after accepting and being duly elected, to qualify and serve on the board.

Medical Service at the Paris Exposition of 1900.—It is amusing to note in the discussions of this subject that the medical service at our Columbian Exposition seems to be regarded by the Parisians as an unattainable ideal, absolutely beyond realization. Baudouin of the *Progrès Méd.* remarks that he actually had to lie down on one of the beds in the hospital *inside the grounds* at Chicago, to convince himself that he was not dreaming.

To prevent Adulteration of South Carolina Candy.—A law was passed at the recent session of the general assembly of South Carolina prohibiting, under penalty of not less than $50 nor more than 100, the manufacture for sale, knowingly selling, or offering for sale, of any candy adulterated by the admixture of terra alba, barytes, talc, or any other mineral substance, or by poisonous colors or flavors or other ingredients deleterious or detrimental to health. The candy so adulterated shall be forfeited and destroyed under direction of the court.

The "American Suture" the Invention of Chassaignac.—The intradermic suture was much admired by Pozzi as he saw it employed at the Johns Hopkins Hospital in Baltimore on his visit to this country. He introduced it into France, where it has been quite generally adopted, and called the "American suture." It has now been found that it was originally the invention of Chassaignac, and is described by him in full in the *Bulletin de therapeutique* in 1852. Hereafter the French will call it the Chassaignac suture. As the little knots to hold the thread are hard to make, some surgeons use a small piece of lead for the purpose, and others a small roll of iodoform gauze, which is always ready and requires no further sterilization.—*Union Méd.*, July 11.

The Silver Craze.—As a foretaste of what may be a common occurrence, we print the following from one of our advertisers, a very shrewd business man, who writes us a follows: "Referring to the way of advertising which you suggest, I already submitted to our board a proposition of this kind, which you made to me, at the time I had the pleasure of seeing you in Chicago, but they don't like to advertise in this way, and just now, they requested me to limit the advertising expenses as much as possible, because we don't know how the anarchists of the Windy City will turn out in November, at the time of the elections. You will understand quite well, that if we have to pay for our goods in gold and get 53 cents in silver for $1.00 of gold, we will be in such a bad fix that we will have to reduce still more our advertising expenses in order to meet all emergencies. I don't believe that we will do anything new in the way of advertising between now and the end of this year. We are cautious people and we never do anything which we are not sure we can carry out."

Cessation of a Medical Journal in Havana.—The *Revista de Ciencias Medicas*, of Havana, closes its eleventh and last year with the June number. The farewell editorial pathetically states that the management is compelled to this decision by "the circumstances through which the country is passing, the general scarcity of resources, the dispersion of the noble medical family . . . the absence of beloved friends whose coöperation has been so valuable to us, but especially as the immediate cause, by the assessment levied upon a periodical devoted exclusively to the publication of scientific matters. . . . "Stronger and more solid structures have fallen, men of prominence have been overwhelmed, family after family ruined, and happy hearths deserted; the disappearance of the *Revista* is merely an incident in the general ruin and desolation on all sides."

Fees for Postmortem Examinations in South Carolina.—By law passed in 1896, physicians in South Carolina shall be paid the following fees for postmortem examinations and testifying at coroner's inquests: For a postmortem examination and testifying, when no dissection is required $5; when dissection is necessary and the body not interred, if requested, by the coroner's jury, $10; for same after interment for three days or more, $15; for chemic analysis, a sum not exceeding $40 and expenses for such analysis; and when chemic analysis has been made the chemist who makes it must furnish to the county board of commissioners, with his account a full statement of the analysis. The clerk of the county board of commissioners shall verify and file with the clerk of court of general sessions a copy of such statement of analysis and account. Provided, that nothing contained in this act shall apply to counties of Barnwell and Williamsburg. The account of claim for the services herein named shall be certified to by the coroner, and if dissection is made it shall be certified that it was done at the request of the jury.

Progress in the Preventive Treatment of Cholera.—The May number of *Annales Pasteur*, reports another forward stride in our knowledge of cholera, and the methods of preventing it. Roux, Metchnikoff and Taurelli announce that they have established the fact that cholera is an intoxication, and to combat it an *antitoxic* serum is required and not an *antimicrobian* as Pfeiffer asserts. This serum they have succeeded in producing for experimental purposes. Animals injected with it before they are inoculated with the comma bacilli, resist the action of the latter in most cases, while animals inoculated without it almost all succumb. The same favorable results are obtained if the serum is administered simultaneously with the bacilli culture. But the results are negative if it is administered after the inoculation. The serum therefore is not curative, but it is preventive, which is, however a great advance. The experimenters hope to secure better results when they have obtained a stronger serum.—*Annales de la Soc. Méd. Chir. de Liége*, June.

Liquid Salol in Surgery.—Salol becomes liquid at a temperature of 108 degrees and remains fluid for fifteen to twenty minutes. In this state it is slightly syrupy, but much less than glycerin and will pass through a Pravaz syringe without the slightest difficulty. While fluid, different antiseptics can be mixed with it, and as it solidifies the two substances become intimately blended. Salol thus combined with iodoform or aristol has many uses in surgery, especially in cases of osseous cavities from tuberculosis, osteomyelitis, etc. After trephining it can be used in the place of iodoform gauze, with the advantage that the suture can be made directly on the injection, and union by first intention thus secured. It can be prepared at a moment's notice at the bedside, by heating the salol and the other substances together in a test tube over a lamp. It has also proved very effective in tuberculous adenitis. Two or three drops of the iodoform-salol injected into the tumor will either abort it or else render it much more benign in its development.—Reynier in the *Jour. de M. et de C. Prat.* Quoted by the *Annales de la Soc. Méd.-Chir. de Liége*, June.

Sudden Death after Puncture of a Hydatic Cyst.—Chauffard reports a case of almost immediate death with symptoms of a triple reaction, cutaneous, cerebro-spinal and myocardiac, following a simple exploratory puncture with a Pravaz syringe, of the anterior surface of the liver, below the ribs. Ten centimeters of a characteristic limpid fluid were withdrawn, confirming the diagnosis of hydatic cyst. The subject was a vigorous man, 38, with traces of old benign syphilis, malarial attacks in 1887, at which time he was drinking absinthe to excess, but not since. The necropsy showed marked compensation in the liver; the sound lobe weighing 1,205 grams, and the other 1,245. The liver with the cyst weighed 6,500 grams. The

other organs were apparently normal; death occurred in systole, and the heart was found empty. The hydatic fluid was tested both chemically and by inoculating guinea pigs, with negative results. No alkaloids were discovered in it, but there were traces of an albuminoid, apparently belonging to the mucin group. Chauffard attributes the fatal result to the escape of some of the hydatic fluid into the peritoneum, as the puncture had been completed several minutes before the disturbances began. The intense toxic effect can only be due to some individual reaction or idiosyncrasy, "to use the old term which expresses in so many instances, the limits of the knowable." He adds the warning that owing to the possibility of such an idiosyncrasy, which it is impossible to foresee, this operation is one to be approached with caution in cases of hydatic cyst. His report includes a review of the literature on the subject.—*Semaine Médicale*, July 8.

Retirement of Dr. I. N. Love from Marion-Sims College, St. Louis.—Dr. Love, who has been for many years connected with medical college circles of St. Louis, has tendered his resignation, owing to the fact that his private practice and his *Medical Mirror* work require his undivided attention. The *Alienist and Neurologist* of St. Louis for July says: "The resignation of Dr. I. N. Love from the chair of Clinical Medicine and Diseases of Children in Marion-Sims College of Medicine leaves a void in the faculty of this institution that will not be easily filled. Love's lectures are fluent and instructive, and so entertaining as to always hold his class in rapt attention while he speaks, a desideratum in the teaching corps of a medical college too often overlooked. In many medical schools no style of speaking and teaching is considered too dry for the medical student, a plain-speaking knowledge of the English language not always being regarded as requisite. Love taught the science of his chair in entertaining phrase and never made a student tired to listen to him." Dr. Love's large acquaintance and great popularity in the medical profession of America as well as abroad, together with his ability as a teacher, should make his place hard to fill in any college. A special committee appointed by the faculty, composed of Drs. B. M. Hypes, R. C. Atkinson and C. Borck, expressed full appreciation for past services of Dr. Love and kindliest hopes for future pleasure and profit in all his relations.

The Etiology of Appendicitis.—There has been much discussion of Dieulafoy's statement that appendicitis is invariably caused by a calculus or some accumulation of fecal or foreign matters, which obstruct the appendix and transform it into a closed cavity. It is confirmed by Klecki and Roger, who have proved that the bacilli circulating harmlessly through the intestines, acquire extreme virulence when arrested and forced to stagnate in a closed cavity. In this virulent state they soon find their way through the enclosing walls and produce infection, even before there is actual perforation. Dieulafoy ascribes the obstruction of the appendix in many cases to the formation of a calculus and states that the appendix makes a trio with the renal and biliary systems in the formation of calculi. He classes appendicitis with the arthritic family, in which the French include all forms of rheumatism and rheumatic neuralgia, gout, obesity, and the tendency to the formation of biliary and renal calculi, as also asthma and migraine. These diseases are not contagious, but they are all hereditary, that is they can be transmitted from parent to offspring, either directly or by the inheritance of the tendency, so that although the offspring may not inherit the same disease, he is liable to any one of the group, as they are chronic conditions of imperfect chemic or organic transformations in the organism. The Germans are not so fond of grouping diseases as the French, and the arthritic tendency is neither so frequent nor so pronounced with them as in the countries farther west, consequently Dieulafoy's classification has not been accepted in Germany.—*Deutsche Med. Woch.*, July 2.

Etiology of Hysteria.—An article with this title by Sigm. Freud has just been concluded in the *Wien. Klin. Rundsch.*, Nos. 22 to 26. He makes the grave assertion that hysteria, hysteric parasthesia or paraplegia, hysteric sensations, etc., and probably also paranoia, "compulsory ideas" and various psychoses, are all traceable to one cause, viz., conscious or unconscious memories of sexual occurrences in early childhood, and that the character of the neurosis is directly determined by the character of the sexual actions. The hysteria commences with an effort of the will to throw off some haunting idea; this idea is connected either logically or by association with some unconscious memory; this unconscious memory is invariably of one or more sexual occurrences dating perhaps from the earliest childhood. The hysteria usually develops after puberty, but in the severest cases it commences with unfailing regularity at the eighth year. The sexual events that preceded it date therefore, from a still earlier age, in some cases from the fourth, third or even the second year. In the eighth year, the period following the second dentition, the sexual system probably passes into another stage of development, as the same sexual events commencing or continuing after this period, have none of this pathogenic effect. Freud believes that the original instigation always proceeds from an adult. His statements are based on extensive clinical experience. and scrupulously careful investigations. He expects to meet with opposition and incredulity, until the pathogenic power of unconscious memories is more fully recognized than at present.

On the Indecency of Patent Medicine Announcements.—The *Medical and Surgical Reporter* commends the conductors of the *Ladies' Home Journal* for their avoidance of those advertisements, so largely addressed to suffering mankind, and for taking the ground that as the better portion of the medical profession will not advertise, they the conductors of the *Journal* will not cater to those not in good standing in their profession and yet willing to publish their wares. It further says: "The patent medicine monger has recently awakened to the fact that young girls have not been sufficiently instructed in the psychic and physical phenomena of puberty and menstruation. Here, as in modern fiction, the worst sinners are women who first catch the eye of the victim with some such complaint as that "only a woman can understand woman's woes." Frequently we encounter the picture of a miss of 18 writhing with dysmenorrhea, and the latest abomination is a novelette in which some phase of female weakness stands between the heroine and marital bliss, and in which sexual restoration, a vegetable compound, and marriage bells are artistically mingled. *The purpose of such advertisements is manifestly to direct the attention of the young woman to her sexual organs*, to exaggerate the importance of trifling abnormalities incident to civilized life, to awaken the sexual instinct, and at the same time to arouse forebodings as to the existence of some physical obstacle to marriage and reproduction, so that a sale of remedies may be effected. Although actual indecency of phraseology is studiously avoided, the moral and mental tendencies of such literature are decidedly injurious. We grant that the ideal of the last generation of ignorance as innocence was not a wise one, and that the girl should be instructed in the physiology and hygiene of the pelvic organs. But the instructor should be the mother, teacher, or some other intimate and mature female friend, and we would prefer ignorance to the obtaining of knowlege from a mercenary charlatan, while false modesty is better than no modesty at all.

The climax of indecency is reached with the proclamation of the abortifacient nostrum. Pennyroyal seems to be the favorite catch-word, and women are informed that the pill or powder in question is prompt, sure and safe, and this statement is often coupled with the sly intimation that it should not be taken by women who are pregnant, since it will produce abortion. In many, if not most cases, the women who buy these

nostrums desire the discharge of something more than blood from the uterus, and the advertiser, without direct allusion to criminal therapeutics, is calculating not on the patronage of women already in trouble, but on those who will yield more readily to temptation if the danger of pregnancy is eliminated."

A Sneer from Merck's "American Medico-Surgical Bulletin."—The shrinking modesty characteristic of a trade organ, believed to be operated by and for an importing branch of a foreign drug house in New York city, induces it to print the following ill-mannered slur. This is the sheet that has heretofore omitted no opportunity to print unkind and discourteous words of the ASSOCIATION and its membership:

"THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—Our most esteemed friend in spirit, the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, appears to be having a wofully hard time in selecting a permanent abode. The atmosphere of Chicago does not appear to agree with it, and it thinks a little of testing the National capital. So far no voice seems to have been raised in favor of New York, and yet, since this is the center of medicine, why should it not come to our welcoming arms—JOURNAL, Editor, Code and all. It can fight our very much esteemed contemporary, the *Medical Record*, to better advantage here than from a distance, and we can assure it that it will find the editor of the *Record* a much better and milder and every way more acceptable individual than he appears to be from a distance. We think it might sleep in the same bed with equanimity as that which another great friend of ours occupies—the *New York Medical Journal;* and we are satisfied from personal contact that the *News* (late of Philadelphia and now of New York) is overflowing with the spirit of brotherly love. As for ourselves it would please us greatly to look at this great organ from close quarters, and we may without loss of modesty say that we think we could teach it something along the line of fearless, independent, scientific journalism. Further still, personal contact would make the JOURNAL love the *Bulletin* a little more and a little long, so that from every point of view we trust that our suggestion will prove acceptable, and that New York may become still more the headquarters of peace and good will in medical journalism."

The Proof of Insanity.—In the April number of the *Physician and Surgeon*, Professor Frank T. Lodge of the Michigan College of Medicine, contributes a paper on insanity in its relations to crimes, contracts and wills, inclusive of the spirit of the laws of his State as to the proof of mental alienation. On the latter branch of his subject he writes, "In nearly every case where insanity is set up, physicians are called as witnesses. The law does not recognize expert testimony in these cases as being of any greater value than that of ordinary persons. The credibility of each person's testimony, be it laymen or doctor, is to be weighed and determined by the jury. Nevertheless, if the testimony of a physician, called as an expert witness, is properly given, it must and should have great weight with the jury. As a rule, the physician will be called to testify with reference to the particular person whose sanity is under consideration. His testimony should be based upon a previous examination. The subtle essence of the mind can not be subjected to ocular and visual examination. Its quality must be determined from close observation of the acts and conversation of its owner. Most physicians testify from a short conversation with the person, and we all know how unsatisfactory such an examination is. Nervous persons of perfectly sound mind may appear almost insane under certain conditions, while the wildest lunatic frequently converses for hours rationally and intelligently. In many cases it is only when his particular hobby happens to be touched upon that he manifests his mental bias, and in the absence of previous knowledge, how can the examiner know toward what point to direct his inquiry? In my opinion, the sanity of no person should be decided until he has been under close observation by competent physicians for a considerable period, say from one to two months, under all the circumstances most favorable to the examination. The examiner should be furnished with the life history of the patient, the history of his family for the preceding two or three generations, the mental condition of his ancestors with relation to possible hereditary taints, and the many other details which will readily occur to all of you. Without this opportunity for a careful and thorough examination, there will always be abundant opportunity for punishing innocent persons for crime, for setting clever and unscrupulous scoundrels at large and for depriving imbecile and incapable persons of large property interests by the clever machinations of designing villains."

Birch Agaric in Cancerous and Non-cancerous Gastro-Intestinal Disturbances.—The belief is current in Russia that the polyporus betulinus will cure cancer. Smirnow has been testing it and finds that it is highly efficacious in chronic gastro-intestinal troubles accompanying cancer and other inflammatory conditions of the stomach and intestines. The cancer itself continues its course, but great relief is experienced even in a couple of days after imbibing the strong decoction. The pain subsides; the food can be retained and the inflammation heals, if not cancerous.—*Semaine Médicale*, July 8.

A Powerful Emetic.—A foreign contemporay states that Dr. Kraus, privat-docent in the Medical University of Berlin, having been called upon by the faculty to explain why his name appeared in a testimonial of the alleged virtues of a certain soap, "declined to do so, or even to express regret, and when the faculty, justly indignant, inflicted upon him the severest reprimand at its disposal, he threw up his appointment."

Notes on the British Medical Association Meeting.—At a general meeting of the second day, Dr. Robert Saundby of Birmingham, was elected President of the Council for the next three years, and on motion it was resolved to accept an invitation of the Montreal Branch to visit Canada next year and hold the annual meeting at Montreal in August. An amendment in favor of Portsmouth was lost. Professor Roddick, President of the Montreal Branch of the British Medical Association, was appointed President elect. The business part of next year's meeting will be transacted in London, and only the scientific meetings will be held in the Dominion. The British Association will hold its annual meeting in Toronto next year, and it is hoped that arrangements may be made so that members may attend both.

The Council of the Association decided to present a gold medal to Captain Whitchurch for gallantry in connection with the Chitral expedition, and it was presented by Dr. Barnes, the President. This medal is rarely given, and is consequently greatly prized by those who may be considered worthy of it. The same medal was presented to Dr. Ormrod of Workington, who distinguished himself in connection with the St. Helene colliery explosion.

At the meeting of the Association last year, held in London, there were 3,000 members in attendance; at Bristol the year before 897 members were present, while at Carlisle this year, up to Wednesday evening, the second day of the meeting, only 600 had registered, showing a very small attendance in view of the fact that the Association now has a membership of 16,332.

The scientific work of the Association is divided into nine Sections, as follows: Medicine, Surgery, Obstetrics and Gynecology, Public Medicine, Psychology, Pathology and Bacteriology, Ophthalmology, Diseases of Children, and Ethics.

Speeches at the general sessions are limited to ten minutes. At the sectional meetings no paper is allowed to exceed fifteen minutes, and participators in discussions are allowed ten minutes each.

The discussions in the various Sections are not reported stenographically, but each speaker is furnished with a writing pad at the close of his remarks and asked to write them for publication. Neither are the remarks on motions in the general meetings reported *in extenso*. The members of the Association are beginning to see the absolute necessity and importance of having their proceedings taken dawn by an expert shorthand writer, because there is a movement on foot to the effect that a volume of Transactions be published as soon as possible after each annual meeting, giving full or well-condensed reports of all papers prepared for the meeting, with the discussions that followed, and also verbatim reports of the general meetings.

Duty to Sick Passengers.—A girl of 18 was the only passenger on a certain street car. While there, she became sick and, going to the door, she told the conductor that she was sick, and asked him to stop the car, so that she might get off. He told her to sit down, and she would feel better after a while. She sat down, but felt worse all the time. Presently the conductor passed through the car, and she again appealed to him to stop; but he looked at her, smiled, went to the front of the car, and began talking to the motorman. She then felt dizzy and sick at the stomach, became frightened and dazed, got up from her seat, and staggered toward the rear door for the purpose, she said, of seeing whether she could not get some one on the street to stop the car, and fell unconscious through the door, remaining unconscious for several weeks. The car had then 670 feet to go before reaching the end of the electric route, at which point the girl was to be transferred to a horse car for carriage about a mile further, to her destination. An action was brought against the street car company for damages. June 15, 1896, the court of errors and appeals of New Jersey affirmed a judgment for the plaintiff. McCann v. Newark & S. O. Ry. Co. The court says that in view of the plaintiff's youth, her illness, and her mental disorder, it can not say, as matter of law, that she was bound to exercise the same degree of care and forethought as persons of mature years in the full possession of their faculties would ordinarily exercise; and that it was for the jury to determine whether, under the peculiar conditions then existing, she had used such prudence as it was reasonable to require. The court also holds that it was lawful for the jury to find that, when the plaintiff made her second appeal to the conductor, he was apprised of her serious illness, or, at least, should have inquired further as to her condition. The jury also had the right, the court says, to conclude that, on perceiving or informing himself of the extent of her sickness, it became his duty either to stop the car, so that she might alight as she requested, or else to afford her such reasonable attention as would save her from harm in the moving vehicle. He did none of these things, but passed her by heedlessly, and left her utterly uncared for, when there was no other person at hand to render her assistance. Such conduct would not fulfill the duty of the defendant as a carrier of passengers. It is but a corollary from the principle which enjoins upon these carriers reasonable care for the security of their passengers that when, through sudden illness, a passenger becomes less able to look after his own safety, and that fact is made known to the proper agent of the carrier, the latter must exercise toward the passenger a greater degree of care than is demanded in ordinary circumstances.

Louisville.

Pure Water.—The filter tests, a reference to which was made in these columns some time ago, have at last been completed and the reports of the experts will be made to the Water Company in the near future. A year ago the Louisville Water Company invited all representatives of water filters in the country to compete in a test of efficiency, making very liberal propositions in regard to the conduct of the tests. The result was that four companies erected filters on the ground at the pumping station, the water and steam power being furnished by the water company from the pumps at work. The contest has attracted not only local interest but has attracted the attention of the scientific world, and the success of the test means the adoption of the filter by all the principle towns of the Ohio and Mississippi Valley. The question of a wholesome water supply has agitated the minds of the people of this community for some time, for with every freshet and flood the Ohio becomes a rushing stream of mud, carrying along the drainage from five States at least. The public has not as yet benefited by these tests, for the water pumped into the filters has been allowed to run back at once to the river, but we live in hopes that there will be at least one of the filters represented accepted. The water company had as its representative in the laboratory specially erected, Mr. George W. Fuller, from the Lawrence Experimental Station in Massachusetts, a man of ability and experience. Throughout the test the character of the water from the river, filtered and unfiltered, and the action of the filters had to be carefully recorded and the report is a most thorough and exhaustive one. Three of the filters use alum and the fourth is an electric one. The company has been unusually fortunate in having such a protracted muddy spell as they have had while the tests were in progress, for it has not been equaled since 1875.

Smallpox.—Seven cases of smallpox have developed near Paducah, supposed to have been contracted from the pest-house, which is located near one of the most frequented pikes near the city. There has already been a lawsuit in regard to this building, which is regarded as a menace to the community on account of its location.

Medico-Literary Notes.

Guy's Hospital Gazette.—The editors of this journal have, with that energy and acumen which characterizes them, issued a special Festival Number. It gives a full account of the great festival dinner and an interesting sketch of the history of the hospital.

In a recent work published in Paris by the *Société d'Éditions Scientifiques*, Dr. A. Calmette gives in epitome the result of his investigations into the nature of snake poison and the best way of treating envenomed bites. The only drugs he has found beneficial are the hypochlorite of lime and the chlorid of gold, the use of the latter having been recommended by him in 1892; but he maintains that in the serum of immunized horses there exists a perfect antidote against snake poison. The serum is now prepared in a bulk at the Pasteur Institute in Lille, of which Dr. Calmette is the director. The price of the the book is 3 francs.

A Medical Man's Experience at Sedan.—Dr. Charles E. Ryan, now of Glenlara, Ireland, has written quite an elaborate account of his services with an ambulance during the Franco-German War, and his personal experiences and adventures with both of the opposing armies in 1870-1871. This book may be best described as a series of photographs of the tragic side of a most tragic war. A simple record of what the author or his comrades saw, it constitutes nevertheless an impressive word-painting, and affords a painful view of the ghastly scenes which form the background of the romance of battle. Dr. Ryan was a member of an Anglo-American ambulance in the Franco-German War, and by force of circumstances was brought into close contact with both French and Germans. He does not conceal the fact that he felt great enthusiasm for France at the first, and that his sympathies were throughout with her. Yet he is an honest and just man, and did not fail to note the shortcomings of the French and to recognize the merits of the Germans.

The Standard Biography of Dr. O. W. Holmes, "the genial Autocrat," has appeared in admirable form under the title of "Life and Letters of Oliver Wendell Holmes." The

Book News, June, contained the following points of information interesting to the medical profession: "We have before us one of the most delightful biographies ever produced in the United States, in these two volumes. The author, Mr. John T. Morse, Jr., has every qualification for his task, including that of relationship, as he was a nephew of the subject of the book. All the material obtainable in the form of letters and autobiographic notes has been placed at his disposal, but these are less copious than may have been expected. It appears that letter writing was irksome to Dr. Holmes, and consequently his letters were comparatively few. A report has been current that Dr. Holmes for some time before his death was engaged upon an autobiography. It turns out, however, that he left only some disjointed memoranda in which he had not advanced beyond the period of youth, and had not even covered that period consecutively and thoroughly. Instead of weaving these notes into his text, the biographer has thought it better to print most of them collectively in a separate chapter.

MEDICAL JOURNAL ENTERPRISE IN PARIS.—The publishers of one of the medical papers of Paris, it is said, have hired a large shop almost opposite the School of Medicine on the Boulevard St. Germain, and transformed it into a reading room, free to all the physicians and medical students of Paris, to each of whom a card of admission was sent. The front part of the establishment opens directly on the street, and on one side contains notices of anything which may be interesting from a medical point of view, such as courses of lectures, etc.; the other side is devoted to the latest reports from various news agencies. In the rear of the establishment are found numerous desks, paper and ink, and a case containing several hundred medical papers from various parts of the world. The reading room opens into a small garden where the visitor may smoke.—*Boston Med. Journal.*

A CHOLERA TRACT FROM INDIA.—A most useful little pamphlet on "The Cause and Prevention of Cholera" has been written by Mr. E. H. Hankin, chemical examiner and bacteriologist to the Northwest Provinces and Oudh. It is intended for the people of India, showing how they can easily mitigate the prevalence of cholera by strict attention to the purity of their water supply. Mr. Hankin says that twenty-four cholera epidemics, of which he knows, were stopped on the disinfection of the wells with permanganate. He advises that the permanganate should be added at sunset, so that it may have all the night to settle. In this way the sediment has time to fall to the bottom, and on the following morning the water is fit to drink. The theory being that the permanganate removes the organic matter, consequently the microbes cease to thrive.

THE PUBLIC SERVICES.

Army Changes. Official List of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from Aug. 1 to Aug. 7, 1896.

Capt. William D. Crosby, Asst. Surgeon (Ft. Missoula, Mont.), is granted leave of absence for one month.

Major James C. Worthington, Surgeon, leave of absence granted on account of sickness is further extended one month on account of sickness.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending Aug. 8, 1896.

P. A. Surgeon G. H. Barber, detached from the "New York," ordered home and granted two months' leave.

P. A. Surgeon V. C. B. Means, detached from the "Maine" and ordered to the "New York."

Marine-Hospital Changes. Official list of changes of station, and duties of Medical Officers of the U. S. Marine-Hospital Service, for the sixteen days ended July 31, 1896.

Surgeon H. R. Carter, directed to inspect Marine-Hospital Service at Tampa, Fla., July 28, 1896.

P. A. Surgeon C. T. Peckham, directed to report to Surgeon Godfrey, chairman of board for physical examination, July 24, 1896.

P. A. Surgeon B. W. Brown, granted leave of absence for six days, July 23, 1896.

P. A. Surgeon W. J. S. Stewart, granted leave of absence for four days, July 17, 1896.

Asst. Surgeon C. E. Decker, to proceed from Battle Creek, Mich., to St. Louis, Mo., for duty, July 21, 1896.

Asst. Surgeon Emil Prochazka, granted leave of absence for twenty days, July 23, 1896.

BOARD CONVENED.

Board convened to meet at Port Townsend, Wash., for the physical examination of P. A. Surgeon C. T. Peckham; Surgeon John Godfrey, chairman; W. G. Stimpson, recorder, July 24, 1896.

PROMOTION.

P. A. Surgeon C. E. Banks, commissioned as Surgeon, July 27, 1896.

DEATH.

Surgeon C. S. D. Fessenden, died at Salem, Mass., July 23, 1896.

Circular Letter.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M.-H. SERVICE,
WASHINGTON, D. C., July 31, 1896.

To the Medical Officers of the U. S. Marine-Hospital Service:—It is with regret that I have to announce to the medical officers of the Service the death, on the 23d inst., from a complication of heart and kidney affections, of Surgeon Charles Stewart Davels Fessenden. Surgeon Fessenden was the senior surgeon of the corps, having served since April 4, 1861—a period of more than thirty-five years. He was born in Portland, Maine, Feb. 23, 1828, and was of a family noted in the annals of his native State and the nation. His father, General Samuel Fessenden, was for many years a leader at the bar of Maine, and his eldest brother, William Pitt Fessenden, was the distinguished senator of that State, and during the administration of President Lincoln became Secretary of the Treasury. Two nephews of Surgeon Fessenden rose to the rank of Brigadier General during the Civil War, and others have been prominent in private life, two of them in the profession of medicine.

Surgeon Fessenden was fitted for college at Portland Academy, and in 1844 entered Harvard University, where he pursued his studies for one year; leaving Harvard he became a student at Bowdoin College, from whence he was graduated in 1848.

He studied medicine under Charles W. Thomas, M.D., of Portland, Maine, and attending medical lectures at the Medical School of Maine and also in New York, was graduated in 1851 from the Medical School of Maine. From 1853 to 1856 he was physician in charge of the Portland City Hospital, after which date he became a private practitioner until his appointment as surgeon in the Marine-Hospital Service in 1861.

During the period of his membership in the corps, he served as commanding officer at the ports of Portland, Maine, New York, N. Y., St. Louis, Mo., Norfolk, Va., Louisville, Ky., and Mobile, Ala. During this period he was also a member of three boards of medical officers convened for the examination of applicants for the Service, and of eight boards convened for the physical examination of candidates for admission to the revenue cutter service, beside serving on various special details as inspector.

On account of the failure of his health in the fall of 1895, he was ordered to appear before a board of medical officers for physical examination, and in accordance with the report of the board was placed on waiting orders Nov. 22, 1895.

During the few months which intervened between this date and his demise, Surgeon Fessenden resided at Salem, Mass., at which place his death occurred. Respectfully yours, WALTER WYMAN,
Supervising Surgeon-General, M.-H. S.

Change of Address.

Dunne, A. J., from Springfield to Pittsfield, Mass.
Johnson, C. W., Litchfield, Ill., to 625 Locust Street, St. Louis, Mo.
Kober, G. M., Washington, D. C., to Box 277 Winchester, Va., (care of Mr. Spangler); Klebs, E., from 422 Center Street, to Hotel Majestic Chicago.
Stanley, F. A., from Mobile, Ala., to Julien Hotel, cor. 63d street and Stewart Avenue, Chicago, Ill.

LETTERS RECEIVED

Allen, B. G., Robbins, Tenn.; Ammonial Chem. Co., New York, N. Y.; Asdale, W. J., Pittsburg, Pa.
Brothers, Samuel, New York, N. Y.; Benjamin, D., Camden, N. J.; Battle Creek Sanitarium (2), Battle Creek, Mich.; Burr, C. B., (2) Flint, Mich.; Buehler, Jacob, Indianapolis, Ind.; Blakely, T. J., Avalon, Mo.; Brophy, Truman W., Chicago, Ill.
Cokenower, J. W., Des Moines, Iowa; Coffman, W. H., Georgetown, Ky.
De Courcy, J. O., St. Libory, Ill.
Elliott, J. L., Duluth, Minn.
Fehr, Julius, Hoboken, N. J.; Fairchild Bros., & Foster, New York.
Gihon, A. L., New York, N. Y.; Gundrum, F., Sacramento, Cal.
Howe, Lucien, Buffalo, N. Y.; Henley, A., Fairmount, Ind.; Hodges, J. Allison, Richmond, Va.; Hayne, H. W., (2) Lawrence, Kan.; Hassard, J. G. & Co., New York, N. Y.
Kiernan, Jas. G., Chicago, Ill.; Kearsley, M. J., Austin, Ill.
Loewy, Arthur, Elgin, Ill.
McAlester, Alex., Camden, N. J.; Marchand, Charles, New York, N. Y.; Miller, Irving, Baltimore, Md.; McIntire, Chas., Easton, Pa.; Moore, J. N., Atlantic Mine, Mich.; Mullen, T. R., Marcus, Iowa.
Newell, Mary E., Altoona, Pa.
Prevatt, J. B., Levyville, Fla.
Reed, R., Harvey, Columbus, Ohio: Resinol Chemical Co., Baltimore.
Sattler, Robert, Cincinnati, Ohio; Strueh, Carl, Chicago, Ill.; Stengel, Alfred, Philadelphia, Pa.; Sander, Enno M. W., Co., St. Louis, Mo.; Schering & Glatz, New York, N. Y.; Starkey, Horace M., Chicago, Ill.; Smith, H. F., New Troy, Mich.
Tuley, Henry E., Louisville, Ky.
Walker, W. K., Philadelphia Pa.; Walker, A. B., Canton, Ohio; Willard, Wm. G., Chicago, Ill.